

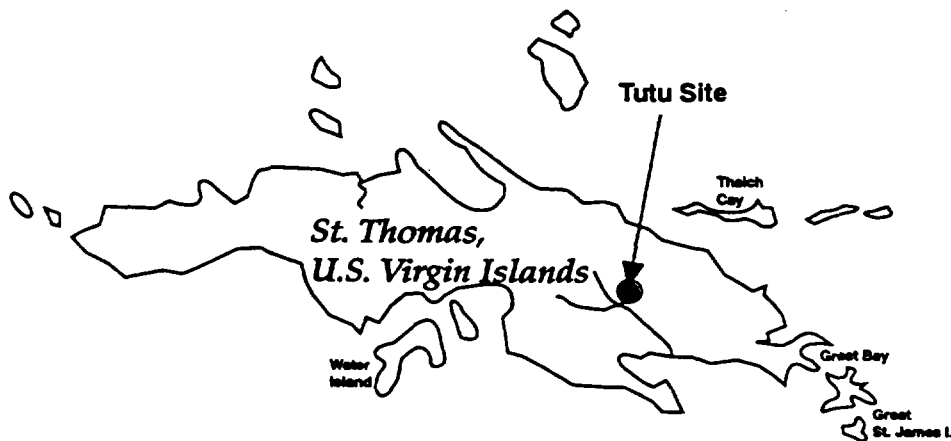
PHASE I REMEDIAL INVESTIGATION REPORT ST. THOMAS, U.S. VIRGIN ISLANDS

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1.0 EXECUTIVE SUMMARY

In December 1993, GCL (formerly H*GCL) conducted a field investigation of the unsaturated zone and groundwater at the Texaco Tutu service station in the Turpentine Run area of St. Thomas, U.S. Virgin Islands. The objectives of this investigation were to:

- Better define the extent and magnitude of petroleum hydrocarbon contamination that resulted from past gasoline product releases at or near the site.
- Obtain data to determine if site activities contributed to the observed halogenated volatile organic compound (HVOC) plume in the Turpentine Run area.
- Collect the necessary soil and groundwater chemical data in order to design a remedial measure to remove petroleum hydrocarbon contaminants from the subsurface.

The investigation of the unsaturated zone at the site consisted of visual inspection of all waste management units, including service bay sumps, oil/water separator, infiltration gallery, septic tank and waste oil drum storage area, and laboratory analysis of soils collected from borings adjacent to or under these units. The groundwater investigation consisted of drilling four on-site and one off-site shallow monitor wells and two on-site deep monitor wells. Soil samples were collected from each monitor well boring for laboratory analysis, and groundwater analytical samples were collected from the monitor wells, including three pre-existing on-site wells, after the new wells were fully developed. The off-site monitor well (TT-6) was drilled approximately 400 feet downgradient of the site to determine the limits of the groundwater petroleum-related plume emanating from the area of the Texaco release point. All soil and water samples were analyzed for volatile organic compounds

(VOCs), including benzene, toluene, ethylbenzene, and xylenes (BTEX) and tert-butyl methyl ether (MTBE). Split samples were obtained by A.D. Little from the infiltration gallery, waste oil drums, and one monitor well located within the site boundary. Split samples were also obtained by Blasland and Bouck personnel from soil borings and monitor wells located within the site boundary.

The results of GCL's field investigation show that BTEX compounds are the only contaminants detected in soil samples at the site. These contaminants are related to residual contamination from the old underground storage tank (UST) pit and minor releases of waste oil from one service bay sump and the oil/water separator. Other than small concentrations of ambient or laboratory contaminants, HVOCs were not detected in any soil samples or in the five samples taken from the bottom of the infiltration gallery. HVOCs were detected in one waste oil drum sampled by Arthur D. Little and Associates (and split by GCL) during the field investigation. Although HVOCs were likely purchased in small quantities and used in service operations at the site, they were not detected in soil samples from the service bays or oil/water separator and infiltration gallery, which received the effluent from the service bays.

The groundwater investigation has shown that the center of mass of the dissolved BTEX plume related to gasoline releases in the area of the Texaco Tutu service station is under the south end of the Texaco site, and north of the Tillett supply well. Natural processes of volatilization and biodegradation, aided by turbulence along fractures induced by past pumping of the Tillett well, effectively attenuated BTEX after less than 400 feet of downgradient transport. Higher concentrations of HVOCs in the deeper aquifer versus the shallow aquifer under the Texaco site

suggest that HVOCs originated from a source or sources other than of the Texaco site. The absence of HVOCs in soil samples, the oil/water separator, and the infiltration gallery at the Texaco site is further evidence that these compounds did not originate from the site.

Based upon the findings of the field investigation and nature of the site geology,

GCL recommends a remedial strategy aimed at removing residual petroleum hydrocarbons from soils in and adjacent to the old UST pit area. GCL believes a strategy of vapor extraction from soils will prevent further migration of hydrocarbons into groundwater underlying the site.

2.0 INTRODUCTION

2.1 SITE LOCATION AND GENERAL DATA

The Texaco Tutu service station is located in the upper Turpentine Run basin in Estate Anna's Retreat in east-central St. Thomas, U.S. Virgin Islands (Figure 1). It is located at the intersection of Highways 38 and 384, southwest of the former LAGA Building, northeast of the Four Winds Shopping Center, and north of the Tillett Gardens Shopping Center (Figure 2). The site has been part of a larger scale investigation of groundwater contamination originating at a number of facilities in the upper Turpentine Run area.

Since it was built in 1964, the Texaco Tutu service station has been in continuous operation. It is a retail outlet for gasoline and diesel fuel, and until recently, also provided minor automotive mechanical servicing, such as oil changes, brake repair, and lubrication. Fuel has been stored at the site in USTs. The original USTs and associated piping were removed in 1988 and replaced with new facilities at a different location at the site.

2.2 SITE HISTORY

In July 1987, water from a supply well in the Tillett Gardens Shopping Center was reported to have an unusual taste and odor. Groundwater from that and other supply wells in the area were analyzed and found to contain gasoline constituents and solvents, such as HVOCs. As a result of the presence of these constituents, the U.S. Virgin Islands Department of Planning and Natural Resources (DPNR) ordered the shutdown of 18 wells in the area by September 1987. Several wells in the area have continued to supply water for non-potable use.

2.2.1 PETROLEUM PRODUCT RELEASES

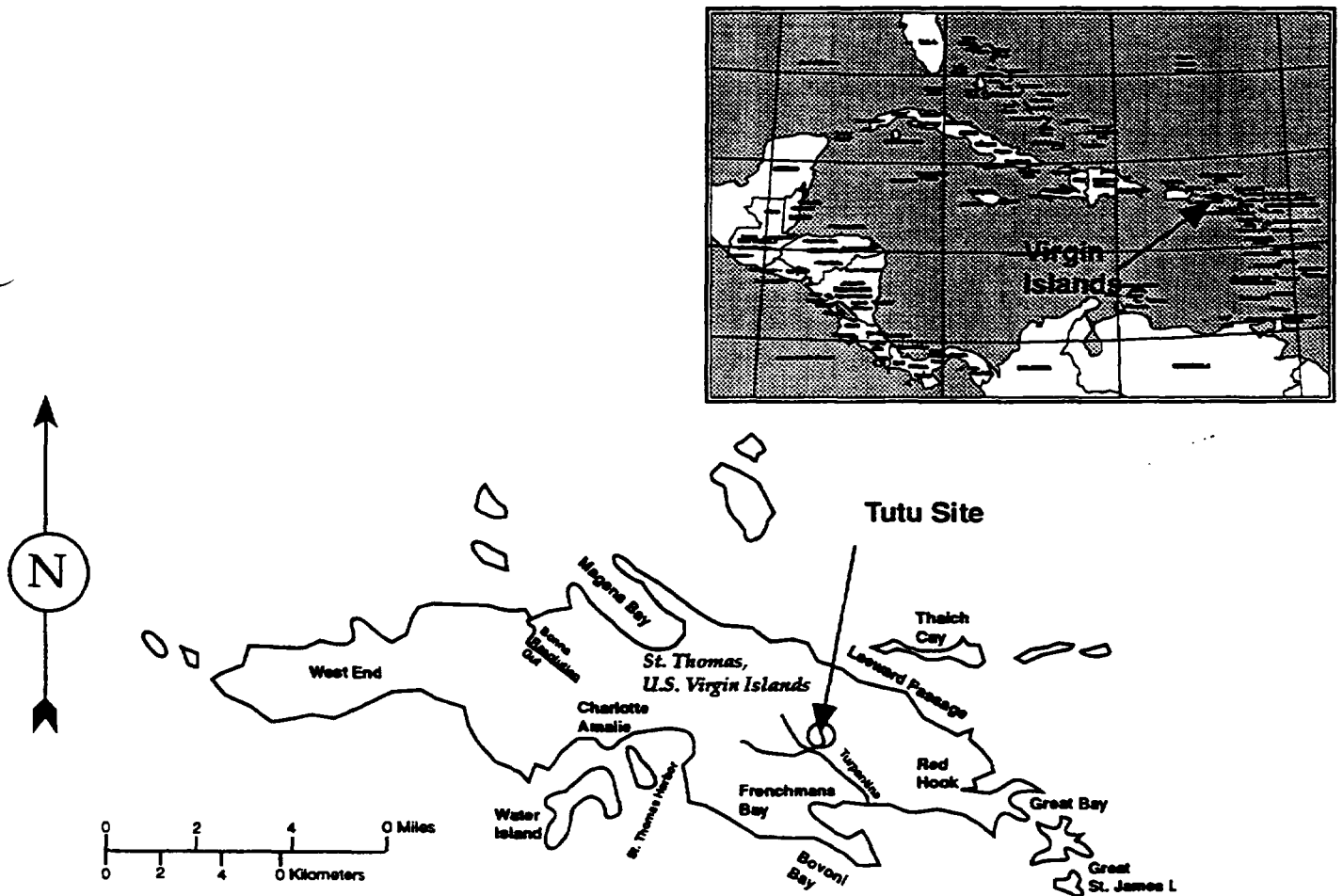
From 1976 to early 1987, several possible releases of petroleum products into soils from the USTs at the site were reported. In September 1987, GCL conducted a soil-gas survey at the Texaco Tutu service station. The survey revealed the possible presence of petroleum constituents on and around the service station, which were assumed to have been the result of gasoline releases from the USTs (GCL, 1988).

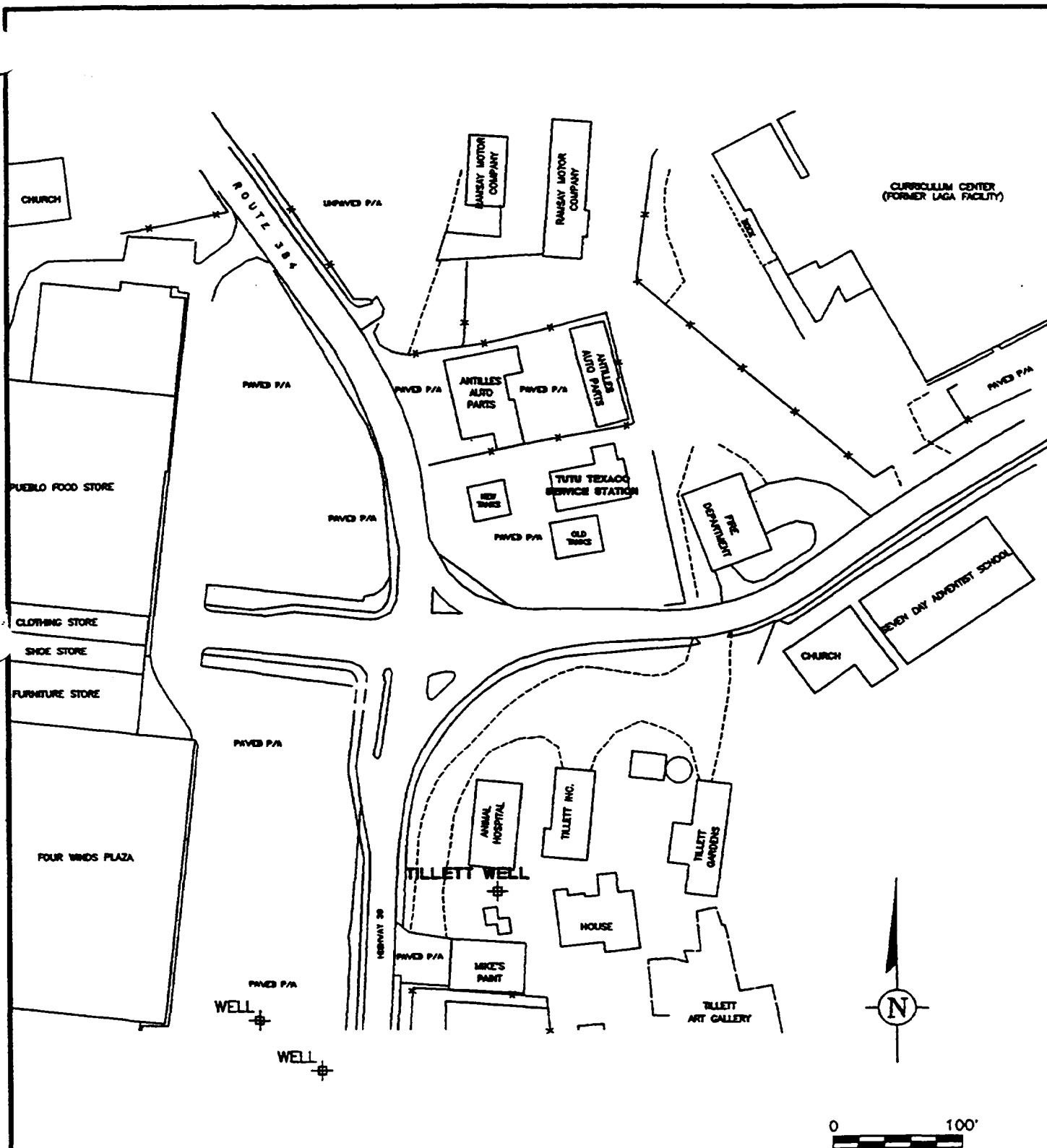
In September 1988, Lebron Associates was contracted to remove the three original steel USTs and replace them with double-walled steel tanks at a different location on site. Soils removed from the tank excavation were placed along the north and east walls of the site and allowed to vent through a series of perforated PVC pipes placed within the soil stockpiles. Strong hydrocarbon odors continued to be monitored in the excavation pit after removal of the old USTs, and the pit was backfilled with clean, gravelly clay soils (Lebron and Associates, 1990). The stockpiled soils were eventually removed from the site and landfilled (Vernon Morgan, Texaco Tutu service station operator, personal communication).

2.2.2 ALLEGED RELEASES OF HALOGENATED VOLATILE ORGANIC COMPOUNDS

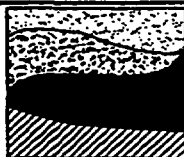
Minor automotive servicing and repair has historically been conducted at the site at three service bays next to the office building (Figure 3). Services included oil changes, tune-ups, brake jobs, and minor engine adjustments. Small quantities of auto degreasing agents may have been purchased from off-site retail stores and used at the site.

Figure 1
General Site Location





GCL



CLIENT: TEXACO TUTU

DATE: 4/12/94

AUTHOR: M.P.

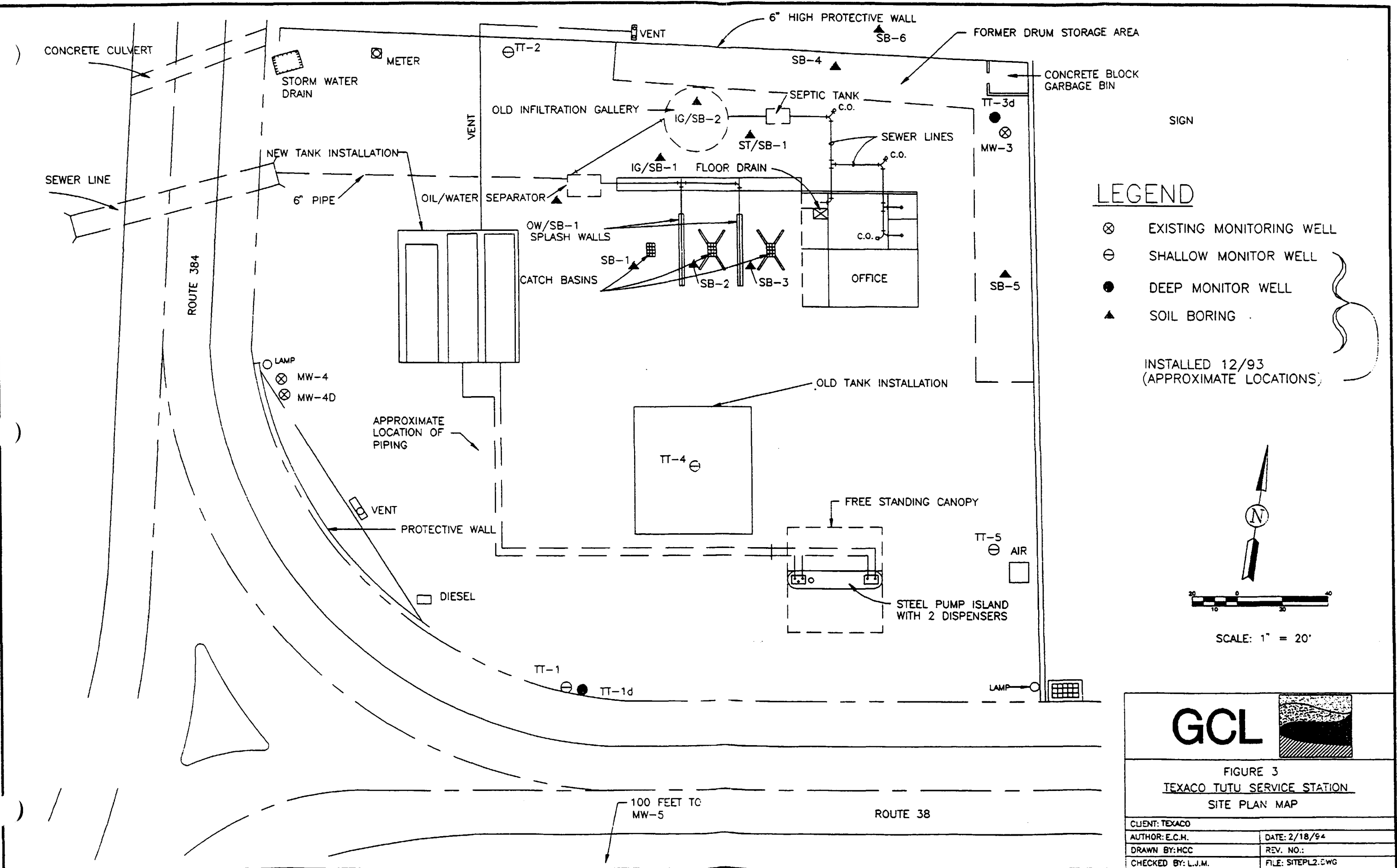
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FIGURE 2
MAP OF CENTRAL TUTU
AREA, ST. THOMAS,
SHOWING TEXACO TUTU
SERVICE STATION AND
NEARBY FACILITIES



From 1972 until the mid-1980s, waste and wash-down water was cycled from sub-grade sumps under each service bay to an API oil/water separator via 4-inch steel pipes. From the mid-1980s to the time the service bays were shut down in 1992, waste oil was captured and stored on site in 55-gallon drums.

A 10-foot deep infiltration tank constructed of rockwall and cinder block is present at the site, and was used to process wastewater from the oil/water separator and the station's septic tank. The infiltration gallery was taken out of service in February 1992, when the station's septic system was hooked up to the municipal sanitary sewer system.

The oil/water separator and infiltration tank have been evaluated as possible pathways for HVOCs to pass into the groundwater at the site. However, analyses of wastewater from the oil/water separator did not detect chlorinated solvents in 1988 and 1989 (CDM FPC, 1990a and CDM FPC, 1990b), and analysis of wastewater samples from the infiltration tank did not detect any tetrachloroethene (PCE) or its decay products in 1991 (Hydrologic Associates, U.S.A., 1993). Furthermore, analyses of samples of waste oil from the 55-gallon drums did not detect PCE or trichloroethene (TCE) in 1989, although methylene chloride and trichloroethane (TCA) were detected as "J" values in two drums (CDM FPC, 1990a and 1990b).

2.3 GOALS AND OBJECTIVES

The primary objectives of the Texaco Tutu site investigation were to:

- Better define the extent and magnitude of petroleum hydrocarbon contamination emanating from USTs as a result of the product releases at the Texaco Tutu site.
- Obtain data to determine if site activities contributed to the observed HVOC groundwater plume in the Turpentine Run area.
- Collect the necessary soil and groundwater chemical data to design a remedial measure to remove petroleum hydrocarbons from the subsurface.
- Understand how contaminants migrate from the Texaco Tutu site under past and present conditions is an important element in the design of an integrated remedial strategy for the Turpentine Run area.

3.0 METHODS

Field investigation methods followed a scope of work outlined in GCL's Site Assessment and Interim Remedial Measures Workplan (1993b). Modifications to the workplan, such as changes in sampling depth and addition of soil boring sites and one monitor well, were dictated by field conditions. The field investigation was carried out by Louis J. Mazzullo, project hydrogeologist, and Patrick Montano, master technician. Mr. Mazzullo and Mr. Montano conducted simultaneous soil boring surveys and monitor well installations. Rance Hall, associate engineer, collected water level data and supervised the cleanout and inspection of the oil/water separator. Mr. Clifford Crook and Mr. Adrian Schottroff, environmental specialists for the U.S. Virgin Islands Department of Planning and Natural Resources, visited the site and provided oversight during the course of the investigation. Field investigators documented site activities with 35 mm photographs. Representative photographs are included in Appendix A.

The site investigation was conducted using the Health and Safety Plan developed by Geraghty and Miller (1991). Activities were primarily conducted with Level D personal protection equipment (PPE), which included hard hats, safety shoes, safety glasses, ear protection, and gloves. Level C PPE, which included full-face respirators and Tyvek suits, were used when cleaning out the service bay sumps. A photo-ionization detector (PID) and combustible gas indicator (CGI) were used to continuously monitor conditions around the rig during the drilling and development of monitor wells and soil borings. The PID and CGI were calibrated at the start of each work day prior to entering the work site.

All equipment was thoroughly decontaminated prior to commencing field work. All drilling equipment, including drill pipe, bits,

hand tools, and well casing, was steam-cleaned with pressurized water heated to a temperature of not less than 160 degrees Fahrenheit prior to down-hole use at each soil boring and monitor well site. Sampling tools were decontaminated with an Alconox detergent, deionized water, and methanol wash prior to use and between sample runs. The submersible pump used for well development was decontaminated between each well using an Alconox wash followed by a freshwater rinse.

3.1 UNSATURATED ZONE INVESTIGATION

The investigation of contaminant contributions from the unsaturated (soil) zone at the site involved:

- Drilling soil borings adjacent to the waste management units (service bay sumps, septic tank, infiltration gallery, and oil/water separator).
- Submitting selected soil samples for laboratory analysis.
- Evacuating the oil/water separator and septic tank.
- Visually inspecting all waste units for structural integrity.

Most of the soil borings were advanced with a hand auger, but site conditions necessitated the use of the drilling rig to advance three of these borings. In addition, soil samples were collected during the drilling of the monitor wells at the site. These samples were collected by running the hand auger through the drill table.

Soil samples were collected and submitted for analysis according to procedures outlined in GCL's workplan (1993b). Investiga-

tive and quality assurance/quality control (QA/QC) samples collected during the investigation were analyzed for VOCs (Environmental Protection Agency Method 8240 + xylenes and MTBE).

3.1.1 SERVICE BAY SUMPS

The sumps in the three service bays were checked for structural integrity after each one was cleaned out by removing wastewater and sediment to 55-gallon drums. The first soil borings were placed alongside the three service bay sumps (Figure 3). GCL personnel collected two soil samples from each of soil borings SB-1, SB-2, and SB-3. Sampling depths in these borings were from 3 and 5 feet below the surface instead of from 2.5 and 5 feet, as called for in the workplan. Soil samples were taken at 3 feet at Texaco's request because this depth corresponded to the depth of the bottom of the service bay sumps adjacent to which the borings were placed.

3.1.2 DRUM STORAGE AREA

Borings SB-4 and SB-5 were placed in the former drum storage areas (Figure 3). Sample depths in these borings were restricted by shallow depth to weathered bedrock, where auger refusal was experienced. Two soil samples were obtained from SB-4 (2.5 and 3.8 feet) and one sample was collected from SB-5. After discovery of stained soils along the north fence, SB-6, which was not called for in the workplan, was placed on the north side of the site with Texaco's concurrence. Samples were collected for analysis from 2.4 and 3.8 feet in this boring, the latter depth corresponding to the top of weathered bedrock where auger refusal was experienced.

3.1.3 OIL/WATER SEPARATOR, INFILTRATION GALLERY, AND SEPTIC TANK

Soils adjacent to these waste management units were sampled and structures visually checked for structural integrity. The oil/water separator and septic tank contained wastewater, and had to be pumped out prior to inspection. A water sample from the oil/water separator was first analyzed and shown to be free of contaminants before pumping. To ensure that maximum soil penetration was achieved alongside each of these units, the drill rig was used to advance the soil borings, and samples were collected through the drill table with a hand auger.

Boring OW/SB-1 was drilled next to the oil/water separator, and a soil sample was collected from 9.5 feet below the surface, which corresponds to the base of the unit. Boring IG/SB-1, adjacent to the infiltration gallery, was sampled at 5 feet below the surface although the base of the gallery is at 10 feet. The sampling depth corresponded to the base of the soil zone at which weathered bedrock was encountered and auger refusal was experienced. In addition, a sample of the base course sand from the bottom of the infiltration gallery (IG/SB-2), at 10 feet below ground level, was collected by lowering the hand auger through an opening jackhammered into the concrete cover of this unit. Boring ST/SB-1, adjacent to the septic tank, was sampled from 5 to 5.5 feet below ground level, where auger refusal was experienced. The base of the septic tank was measured at 9 feet below the surface.

3.1.4 MONITOR WELL BORINGS

Samples were collected from the unsaturated soils encountered during drilling of the monitor wells installed on site. Soil samples

were collected every 2.5 feet using a hand auger from 2.5 feet below ground surface to 4 feet below the water table, or when sampler refusal was encountered. Some modifications to the workplan were necessitated by site conditions, such as shallow depth to bedrock and the presence of rocky soil that prevented sample recovery at the precise sampling depths.

Soils were immediately placed in sealed plastic bags for field head-space analysis with a PID. A second bag was filled for potential laboratory analyses and stored on ice.

Samples submitted for laboratory analysis included soil from the interval directly above the saturated zone and the interval exhibiting the highest PID head-space reading.

Two soil samples were collected from each of the following monitor well borings: TT-1, TT-1d, TT-2, TT-4, and TT-5. Because of the shallow depth to bedrock (less than 2.5 feet), soil samples could not be obtained for laboratory analysis from TT-3d and TT-6.

Monitor well TT-4 was installed in the middle of the old UST basin (Figure 3). Field head-space and laboratory analysis of soil samples from boring TT-4 provide information on past releases from the original UST basin and the extent of hydrocarbon-contaminated soil at this location.

3.2 SATURATED ZONE INVESTIGATION

GCL installed five shallow and two deep groundwater monitor wells during this field investigation. These wells were intended to:

- Assess the on-site contribution of contaminants to the existing contaminant plume beneath the Tutu Turpentine Valley.
- Delineate the horizontal extent and concentration of contaminants in ground water beneath the site, and determine if contaminants were derived from upgradient sources.
- Provide basic data needed to design the remedial system.

Well TT-6, which was not specified in the workplan, was drilled southwest of the site in the Four Winds Shopping Center parking lot. This well was drilled with the concurrence of Texaco and the Four Winds Shopping Center, and was permitted by the DPNR (Appendix B).

3.2.1 DRILLING METHODS

Monitor wells were drilled with an air rotary rig with air hammer capabilities. To facilitate sampling and reduce rig standby time, soil samples were collected, as described in Section 3.1.4, with a hand auger, rather than with a split-spoon sampler tool as originally proposed in the workplan. Mr. Mazzullo provided lithologic descriptions and field head-space measurements on standard lithologic description forms (Appendix C). Appendix D includes completion diagrams of all monitor wells installed during this investigative phase.

The soil zone in each monitor well boring was air-drilled with a 10-inch tri-cone bit until the base of contamination was reached, or to just above the soil/saprolite contact. To mini-

mize cross-contamination from the shallow soil zone to deeper saprolith and bedrock zones, a temporary conductor pipe was set in each monitor well boring (Photo 8) in the 10-inch hole. Prior to running back into the hole with the hammer bit, a circulation ("blooey") line was attached to the conductor pipe so drilling fluids, cuttings, and formation water could be directed to a temporary lined pit. Hammer drilling was accomplished with freshwater or water mixed with a small volume of methanol-based foam, which was approved by the DPNR. Solids and fluids produced from the wells were then transferred to drums or directly to wastewater tanks on site.

3.2.2 WELL CONSTRUCTION

The deep monitor wells (TT-1d and TT-3d) were drilled to provide information on vertical contaminant plume configurations on the downgradient and upgradient sides of the site. The wells were constructed with 2-inch PVC casing and 0.020-slot PVC screen. The workplan called for a 10-foot screen at the bottom of each well to a total depth of approximately 55 feet. A 10-foot screen was set from 53 to 43 feet in TT-3d. Adverse hole conditions (caving) in this well prevented the bentonite seal from being placed below 30 feet. Due to high water production and adverse hole conditions in TT-1d, it was elected to set a 5-foot screen from 50.3 to 45.3 feet in this well. Both wells, however, are screened below the screened intervals in adjacent shallow monitor wells (MW-3 and TT-1, respectively). Construction details for these wells are presented in Appendix D and summarized in Table 1.

The proposed on-site remedial measure wells (TT-1, TT-2, TT-4, and TT-5) were all drilled to an approximate depth of 35 feet below grade. These 4-inch PVC wells were completed with a 20-foot, 0.020- or 0.010-slot PVC screen placed across the water table

interface. Monitor well TT-6 in the Four Winds Shopping Center parking lot was completed with a 10-foot screen because severe hole caving from the saprolith zone prevented placement of a longer screen.

3.2.3 WELL DEVELOPMENT

All monitor wells were developed after the grout seal was fully cured. A 3.5-inch O.D. submersible pump was used to develop the 4-inch shallow monitor wells, and 1.5-inch O.D. teflon bailers were used for the 2-inch deep wells. Development included purging at least three casing volumes per well, until field parameters (pH, specific conductivity, and temperature) stabilized for at least three successive readings. Well development field data, including water levels, field parameters, physical characteristics of the water, and volume developed, were recorded on GCL's standard well development form (Appendix E).

3.2.4 WELL SAMPLING

After development of each monitor well, groundwater investigative and QA/QC samples were collected in accordance with the GCL workplan (1993b). These samples were submitted for analysis of VOCs (Environmental Protection Agency Method 8240 + xylenes). Pre-existing monitor wells MW-3, MW-4, and MW-4d located on the Texaco site were also sampled after being purged of at least three casing volumes using the submersible pump.

3.2.5 SURVEYING

In March 1994, personnel from Geraghty and Miller supervised well surveys of the monitor wells installed by GCL at the Texaco site and well TT-6 in the Four Winds Shopping Center. Ground level and top of casing elevations of all the monitor wells are presented in Table 1.

Table 1
Monitor Well Specifications, December 1993

Well No.	Total Depth Ft. BGL	Screen Size, In.	Slot Size, In.	B/Screen Ft. BGL	T/Screen Ft. BGL	T/Sand Ft. BGL	T/Bentonite Ft. BGL	Ground Level Elevation Ft. AMSL	Top of Casing Elevation Ft. AMSL
TT-1	36.3	4	.010	30.0	10.0	9.0	6.0	179.34	179.03
TT-1d	53.0	2	.020	50.3	45.3	42.5	37.9	179.65	179.45
TT-2	37.0	4	.010	29.0	9.0	8.0	6.0	179.91	179.69
TT-3d	55.0	2	.020	53.0	43.0	30.0*	23.3	182.04	181.75
TT-4	36.0	4	.020	28.5	8.5	10.5	8.0	180.71	180.51
TT-5	38.0	4	.020	30.0	10.0	8.8	7.1	182.58	182.34
TT-6	33.0	4	.010	13.5	3.5	3.2	2.0	169.46	169.18

* Rock obstruction from 33 to 35 feet prevented placement of entire sand pack around screened interval.

BGL = Below Ground Level

FT = Feet

TOC = Top of Casing

AMSL = Above Mean Sea Level

Well survey data collected under the auspices of Geraghty & Miller, March 1994.

Phase I Remedial Investigation Report
St. Thomas, U.S. Virgin Islands



4.0 GEOLOGY AND HYDROGEOLOGY

4.1 GENERAL HYDROGEOLOGY OF THE TURPENTINE RUN AREA

Details of area-wide geology and hydrogeology of the Turpentine Run area are provided by Geraghty and Miller (1993a). The Texaco Tutu service station is located in the upper Turpentine Run of east-central St. Thomas. The bedrock in this area consists of two Cretaceous volcanic units referred to as the Water Island Formation and the younger Louisenhoj Formation. The Water Island Formation is composed primarily of extrusive basalt and basalt breccia, which is unconformably overlain by dark greenish-gray augite-andesite breccia and tuff. The base of the Louisenhoj Formation contains the Cabes Point Conglomerate, which was derived by erosion of the underlying Water Island rocks (Donnelly, 1966).

The Water Island and Louisenhoj Formations are both present in the upper Turpentine Run (Donnelly, 1966). They are offset by a number of strike-slip and normal faults. The bedrock is highly jointed and locally more intensely fractured. Major fault/fracture zones appear to be present along the north-south axis of Route 38, where it runs southward from the Texaco site (along the axis of Turpentine Run), and east to west along Route 38, where it runs eastward from the Texaco station. These tectonic features are identifiable on aerial photographic stereopairs. Many joints and fractures are filled with secondary calcite (Appendix A, Photo 21).

The bedrock is locally overlain by a weathered (saprolith) horizon of variable thickness characterized by clay-supported cobbles and boulders of the volcanic rock (Photo 22). The interstitial clay appears to be composed of montmorillonitic and possibly kaolinitic alteration products of the original

bedrock. The saprolith zone is overlain in places by a thin-to-moderately bedded mantle of clay-rich soil or, along the valley floors, Quaternary alluvial deposits.

The primary aquifer in the area is the fractured volcanic bedrock (Jordan and Cosner, 1973; Geraghty & Miller, 1993a). The fractures are the main conduits for groundwater flow under the area because the rocks exhibit very little primary porosity. Consequently, groundwater yield from wells drilled into the bedrock is dependent upon the intensity and interconnection of fractures intersected by the wellbore.

The secondary aquifer in the area consists of the alluvial deposits in the lower Turpentine Run basin. The alluvial deposits in the upper basin, where the Texaco Tutu service station is located, are not capable of supplying usable amounts of water because of their limited thickness and lateral extent, and because they are commonly unsaturated. The alluvial deposits have been considered to be hydraulically connected to the fractured bedrock, and groundwater in the area is thought to exist under water table conditions, with localized low-permeability layers in the alluvium resulting in localized confined conditions (Geraghty and Miller, 1993a). Groundwater flow in the shallow and deep aquifers has generally been to the south, and is controlled by the major fracture systems and pumpage from area water production wells.

4.2 SITE HYDROGEOLOGY

4.2.1 GENERAL SITE GEOLOGY

The Texaco Tutu service station is located at the intersection of a north-trending "gut" of Turpentine Run and another major east-to-west fracture zone sub-parallel to Route 38. The



geology of the site is defined by lithologic data obtained from nine new soil borings and six new monitor well borings drilled during this investigation, ranging in depth from 2.5 to 55 feet below ground level, and pre-existing monitor wells MW-3, MW-4, and MW-4d. Table 2 summarizes hydrogeologic data obtained from the new borings.

The site is underlain by a variable thickness of saprolith and surficial clayey soils that overlay fractured, augite-andesite breccia of the Louisenhoj Formation. The Cabes Point Conglomerate and underlying Water Island units were not intersected in any of the borings drilled at the site or in the Four Winds Shopping Center parking lot.

Monitor well TT-6 was drilled 400 feet southwest of the Texaco Tutu service station in the Four Winds Shopping Center parking lot. It is situated in the axis of the "Tutu Gut" fracture zone. Figure 4 is a lithologic cross-section from the Texaco site to that well. The cross-section shows that the south end of the Texaco site (i.e., across the street at the north side of Tillett Gardens) is bounded by an up-to-south fault that brings saprolith to the surface (with a corresponding topographic rise in that direction-Photo 23). The existence of this fault is indicated from the surface outcrop of saprolith in the Tillett parking lot and from identification of lineaments on aerial photographs. The weathered zone thickens substantially toward the Four Winds Shopping Center parking lot. This thickening may be supplemented by the admixture of alluvium with the weathered bedrock.

4.2.2 BEDROCK HYDROGEOLOGY

Figure 5 shows that the depth to the fresh andesite breccia bedrock ranges from 11 to 27.5 feet below the surface in borings placed on the Texaco Tutu service station site. This map also

represents the composite thickness of the overlying saprolith and soil zones. A bedrock "high" or ridge extends diagonally under the site and plunges to the southwest. The flanks of this high dip steeply to the southeast and moderately to the northwest. Most of the soil boring locations associated with the waste management units are on the crest or northwest flank of this bedrock high, whereas the old UST pit is located on the southeast flank.

The fresh bedrock under the site appears to yield most, if not all, of the water produced in the monitor wells. Field investigators noted that water was not produced during drilling until the bedrock was encountered, and prolific water production did not occur until larger open fractures were encountered (usually between 27 and 35 feet below the surface).

Groundwater elevations in the on-site shallow monitor wells, including existing monitor wells MW-3 and MW-4 (Table 2), indicate a generally southerly flow direction (Figure 5) with a gradient of 0.018 ft./ft. Groundwater enters the site from the northwest and northeast, which corresponds to the primary fracture directions observed in nearby bedrock outcrops (Photo 21). The deep groundwater flow direction, defined by on-site monitor wells TT-1d, TT-3d, and MW-4d, is essentially due south with a gradient of 0.017 ft./ft.

4.2.3 SOIL AND WEATHERED BEDROCK

Figures 6 and 7 show the thickness of the clay-rich soil above the saprolith under the site. Undisturbed soil is composed of red-brown to green-gray and green-brown, slightly moist clay and sandy clays, except in the area of the old UST pit. This area was filled with gravelly clay that was imported from an unknown source on the island. The soil is stained to a dark gray color where it has been impacted by

Table 2
Hydrogeologic Data from Monitor Wells and Soil Borings

Boring No.	B/Soil Ft. BGL	B/Saprolith Ft. BGL	Saprolith Thickness, Ft.	Initial H2O Level, Ft. Below Top of Casing	H2O Elev. Ft. AMSL
Monitor Wells					
TT-1	15.0	21.0	6.0	12.45	166.58
TT-1d	16.5	25.0	8.5	12.92	166.53
TT-2	5.0	17.0	12.0	11.63	168.06
TT-3d	2.5	11.0	8.5	12.60	169.15
TT-4	11.0	16.5	5.5	13.73	166.78
TT-5	7.5	27.5	20.0	15.50	166.84
TT-6	1.5	27.0	25.5	6.00	163.18
Soil Borings					
SB-1	5.0				
SB-2	5.5				
SB-3	np				
SB-4	3.9				
SB-5	2.5				
SB-6	4.2				
IG/SB-1	5.0				
OW/SB-1	11.0				
ST-SB-1	6.0				

NOTE: Soil thickness for TT-4 and OW/SB-1 may be the result of excavations.

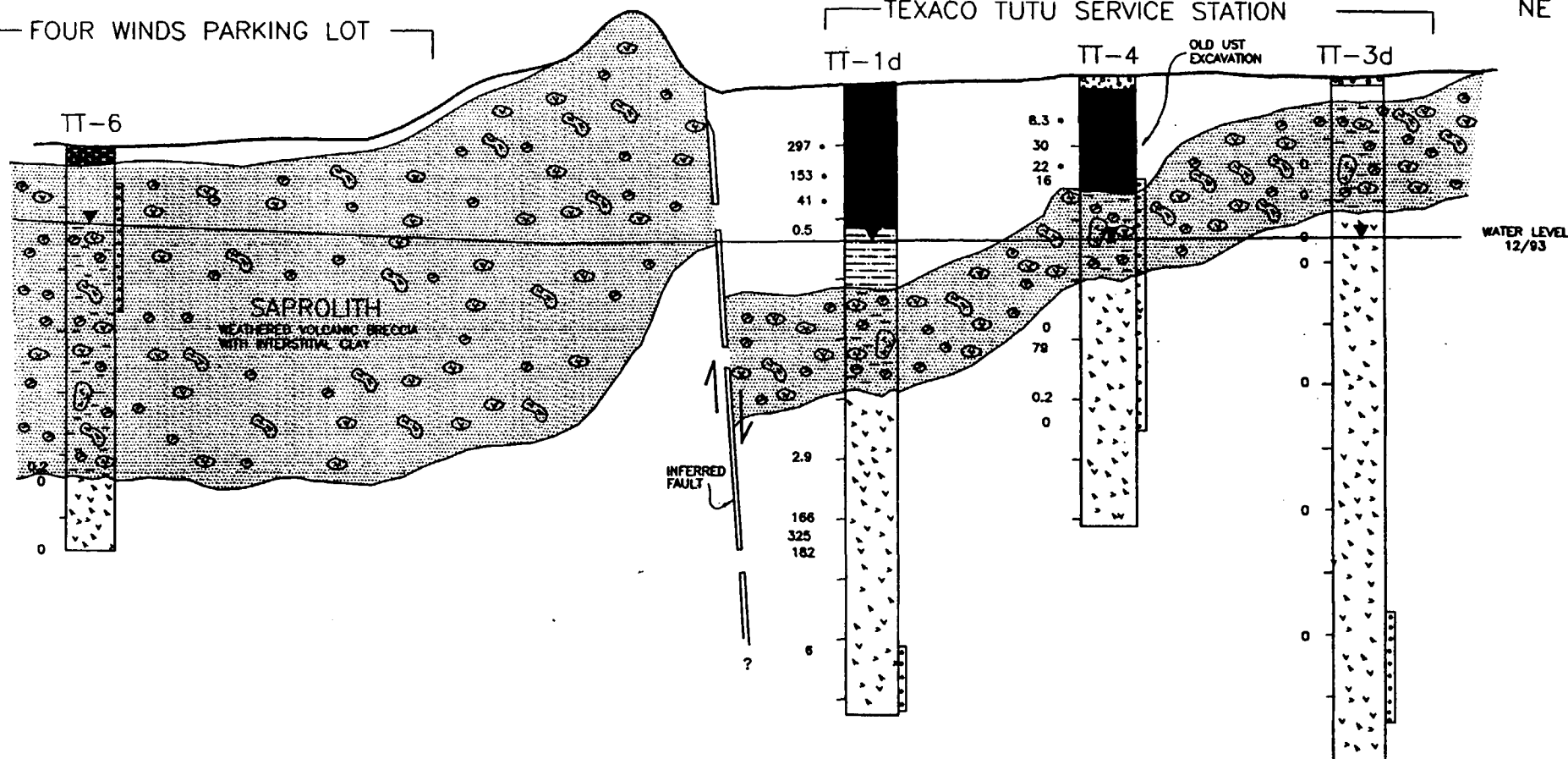
np = Not Penetrated
BGL = Below Ground Level
AMSL = Above Mean Sea Level

SW

FOUR WINDS PARKING LOT

TEXACO TUTU SERVICE STATION

NE



0
VERTICAL SCALE
10 FT.
GROUND ELEVATIONS
NOT SURVEYED

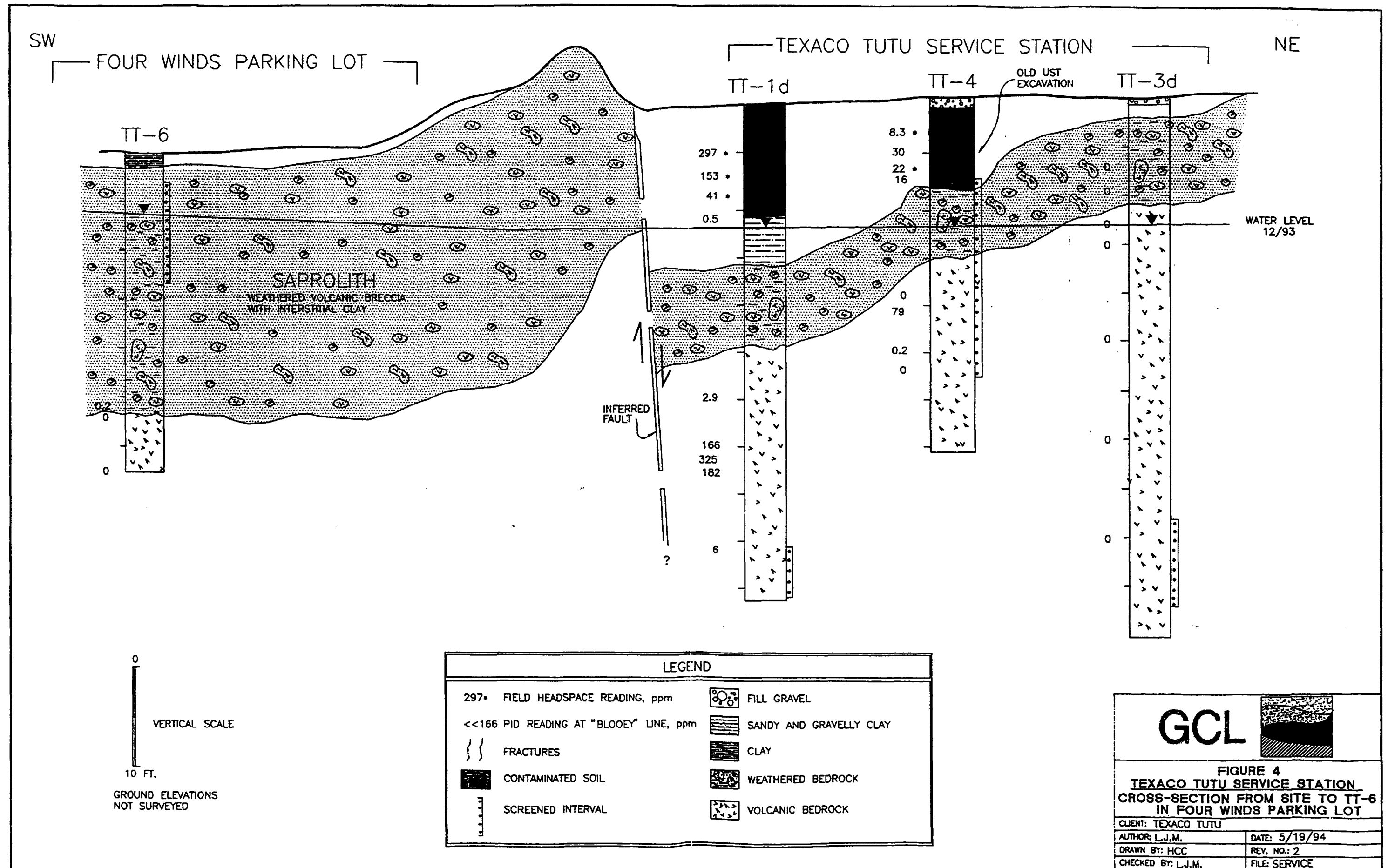
LEGEND			
297 •	FIELD HEADSPACE READING, ppm		FILL GRAVEL
<<166	PID READING AT "BLOOEY" LINE, ppm		SANDY AND GRAVELLY CLAY
{ }	FRACTURES		CLAY
	CONTAMINATED SOIL		WEATHERED BEDROCK
	SCREENED INTERVAL		VOLCANIC BEDROCK

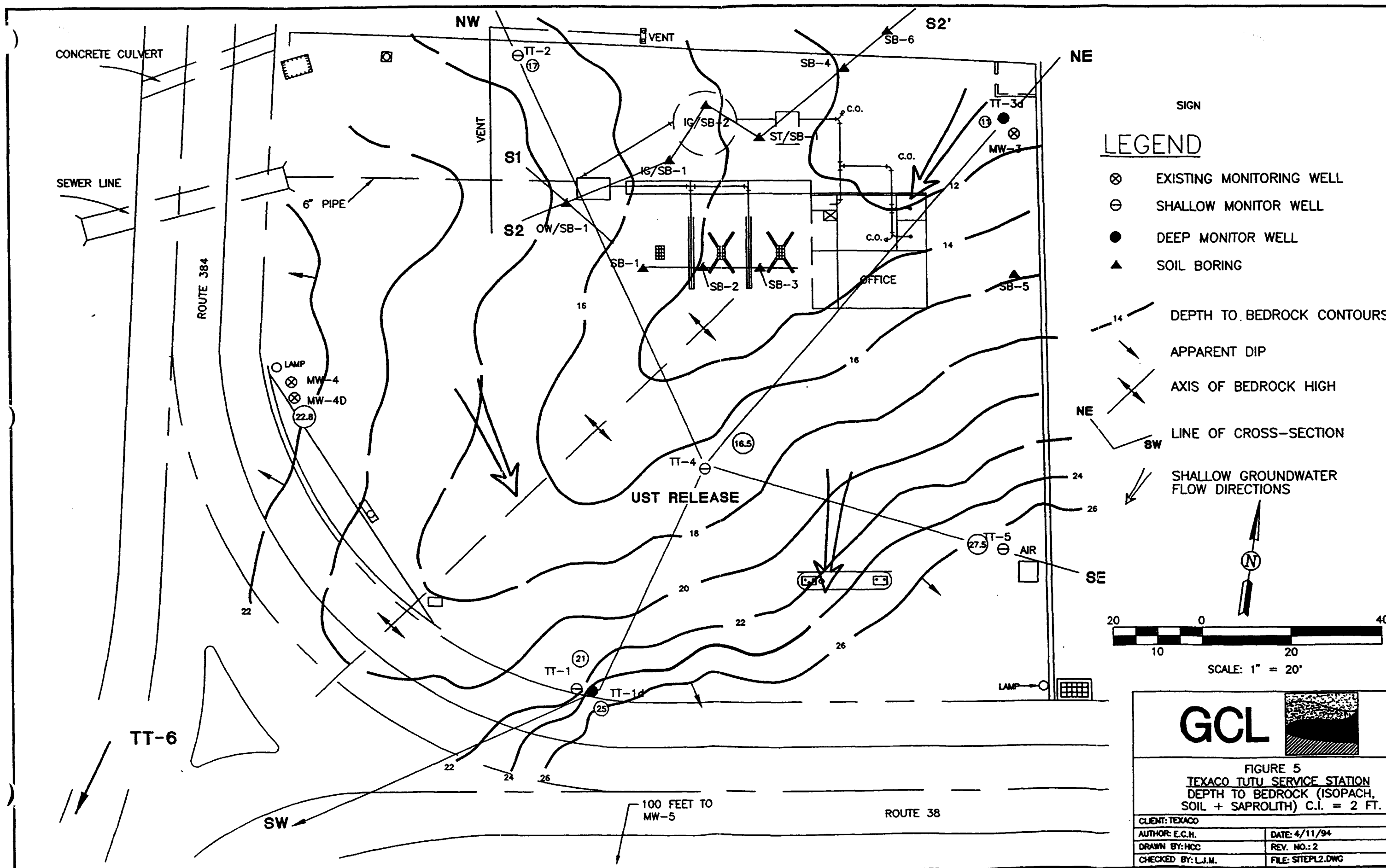
GCL



FIGURE 4
TEXACO TUTU SERVICE STATION
CROSS-SECTION FROM SITE TO TT-6
IN FOUR WINDS PARKING LOT

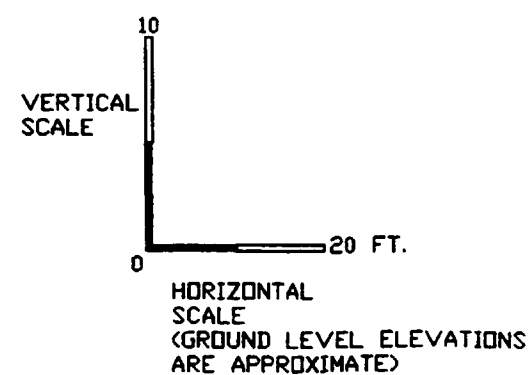
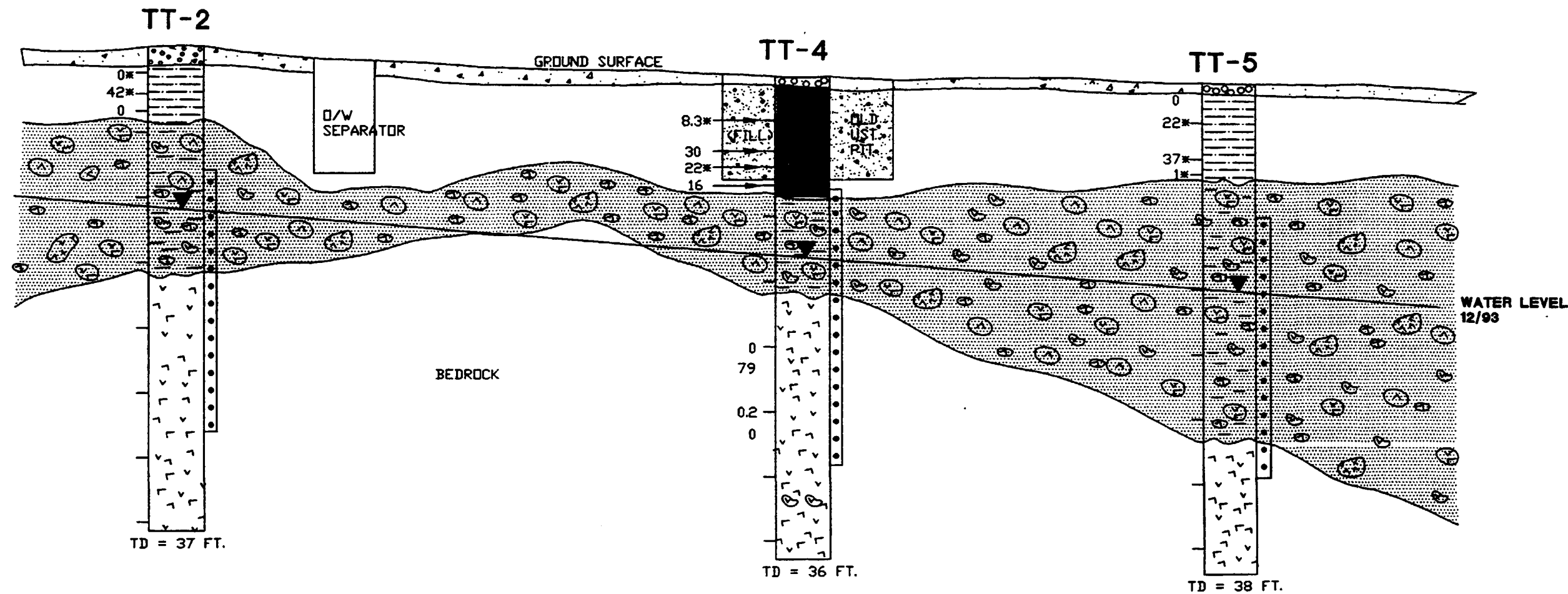
CLIENT: TEXACO TUTU	
AUTHOR: L.J.M.	DATE: 5/19/94
DRAWN BY: HCC	REV. NO: 2
CHECKED BY: L.J.M.	FILE: SERVICE





NW

SE



LEGEND			
296*	FIELD HEADSPACE READING, ppm		SANDY AND GRAVELLY CLAY
166	PID READING AT 'BLOOEY' LINE		CLAY
	FRACTURES		WEATHERED BEDROCK (SAPROLITE)
	CONTAMINATED SOIL		VOLCANIC BEDROCK
	SCREENED INTERVAL		

GCL



FIGURE 6
TEXACO TUTU SERVICE STATION
CROSS-SECTION FROM
MONITOR WELL BORINGS
ACROSS TEXACO SITE

CLIENT: TEXACO TUTU

AUTHOR: L.J.M.

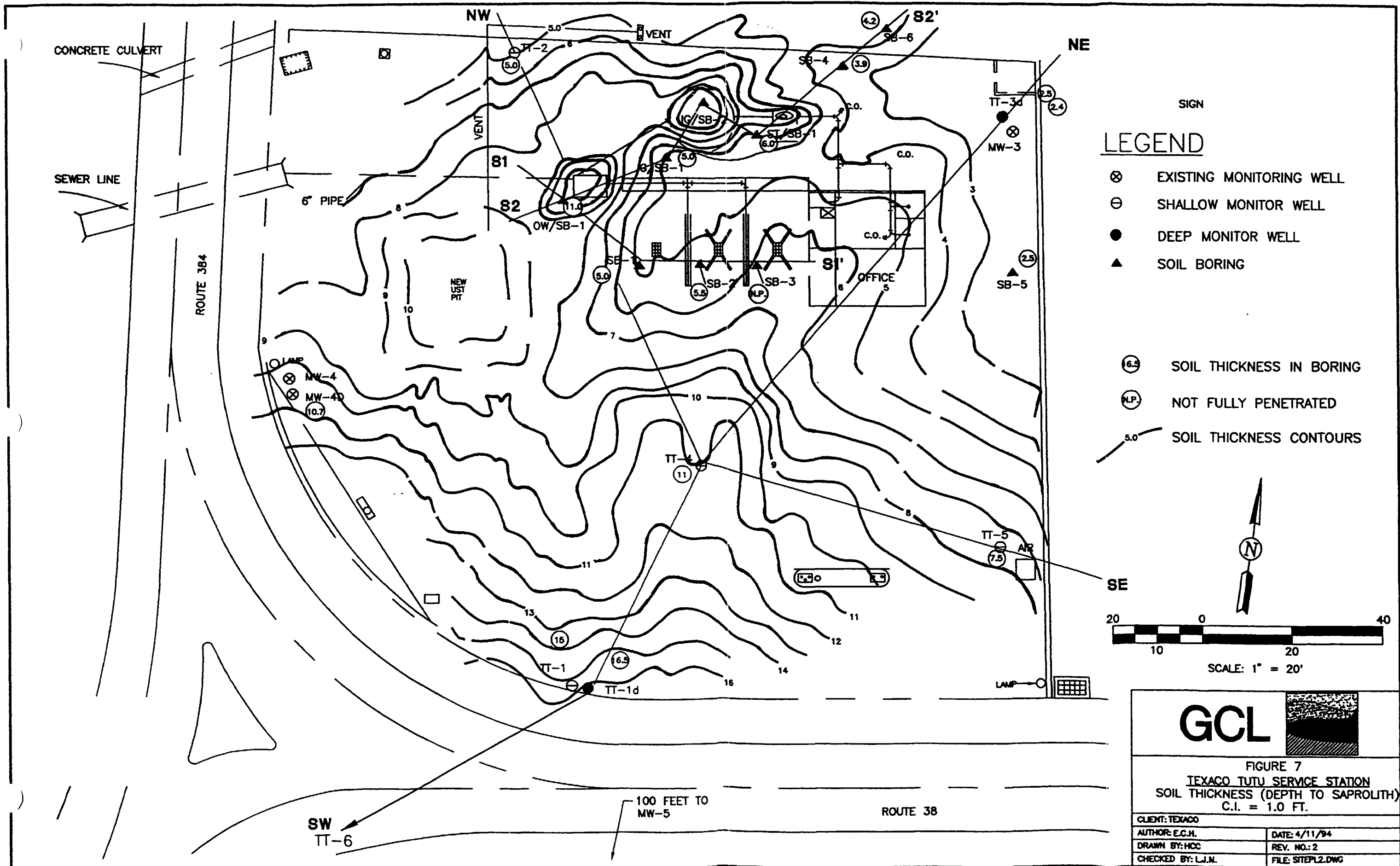
DATE: 4/11/94

DRAWN BY: HCC

REV. NO.: 1

CHECKED BY: L.J.M.

FILE: TT-CRSCT.DWG

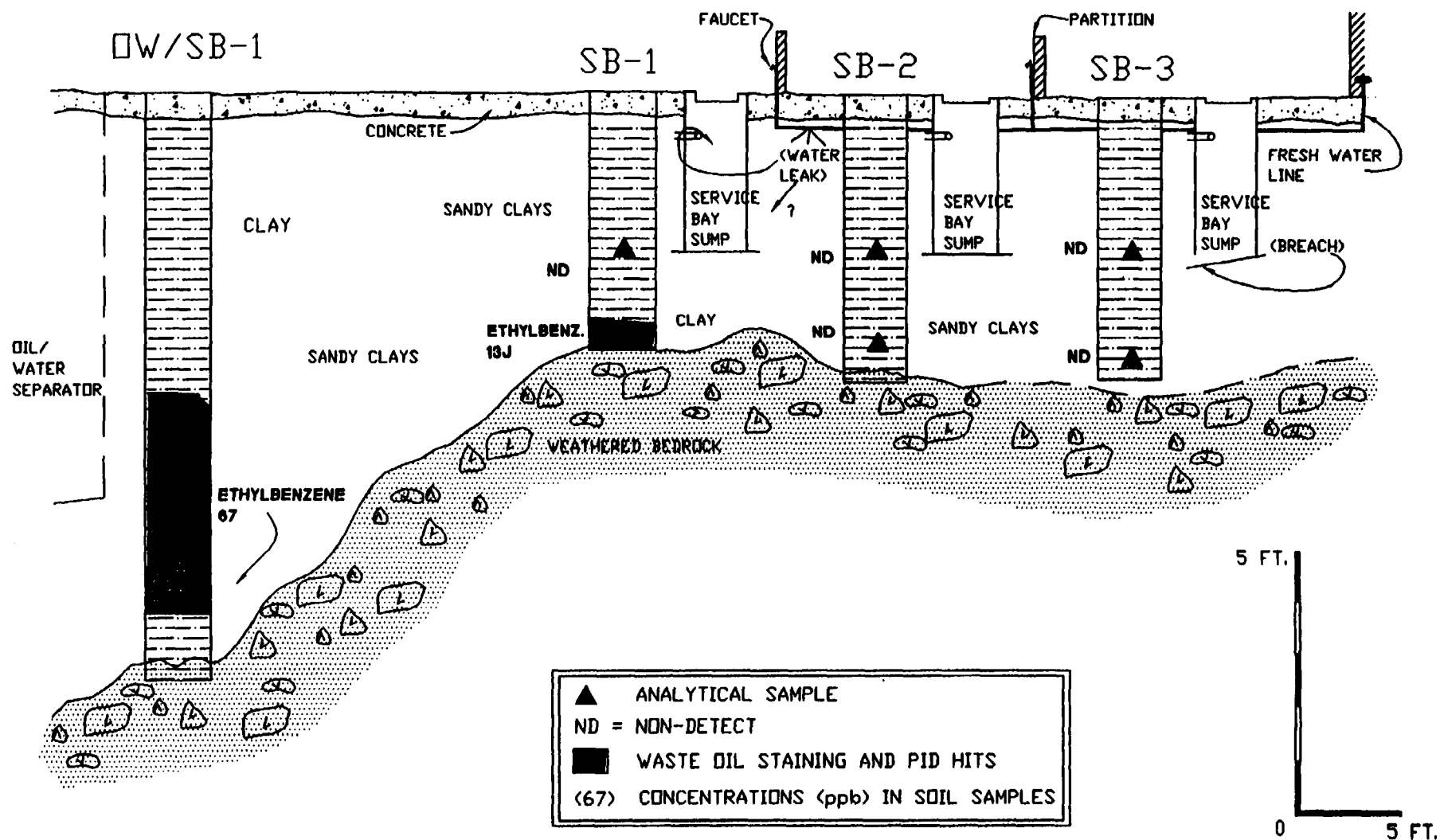


waste oil in the vicinity of the oil/water separator, western service bay sump (SB-1), and SB-6. Figures 8 and 9 are soil cross-sections across the Texaco site. The native soil thickness under the site ranges from 2.4 to over 16.5 feet and thickens abruptly to the south.

The underlying saprolith zone ranges from 5.5 to 20 feet in thickness, and is thickest in the TT-5 borehole on the southeast side of the site. Figures 8 and 9 highlight the irregularity in the surface of the saprolith zone under the site. The saprolith is dark olive-gray in color and generally dry to slightly moist. Field investigators noted that the saprolith zone did not yield noticeable water during drilling of any of the monitor wells.

S1

S1



GCL



CLIENT: TEXACO TUTU

DATE: 4/7/94

REV. NO.: 1

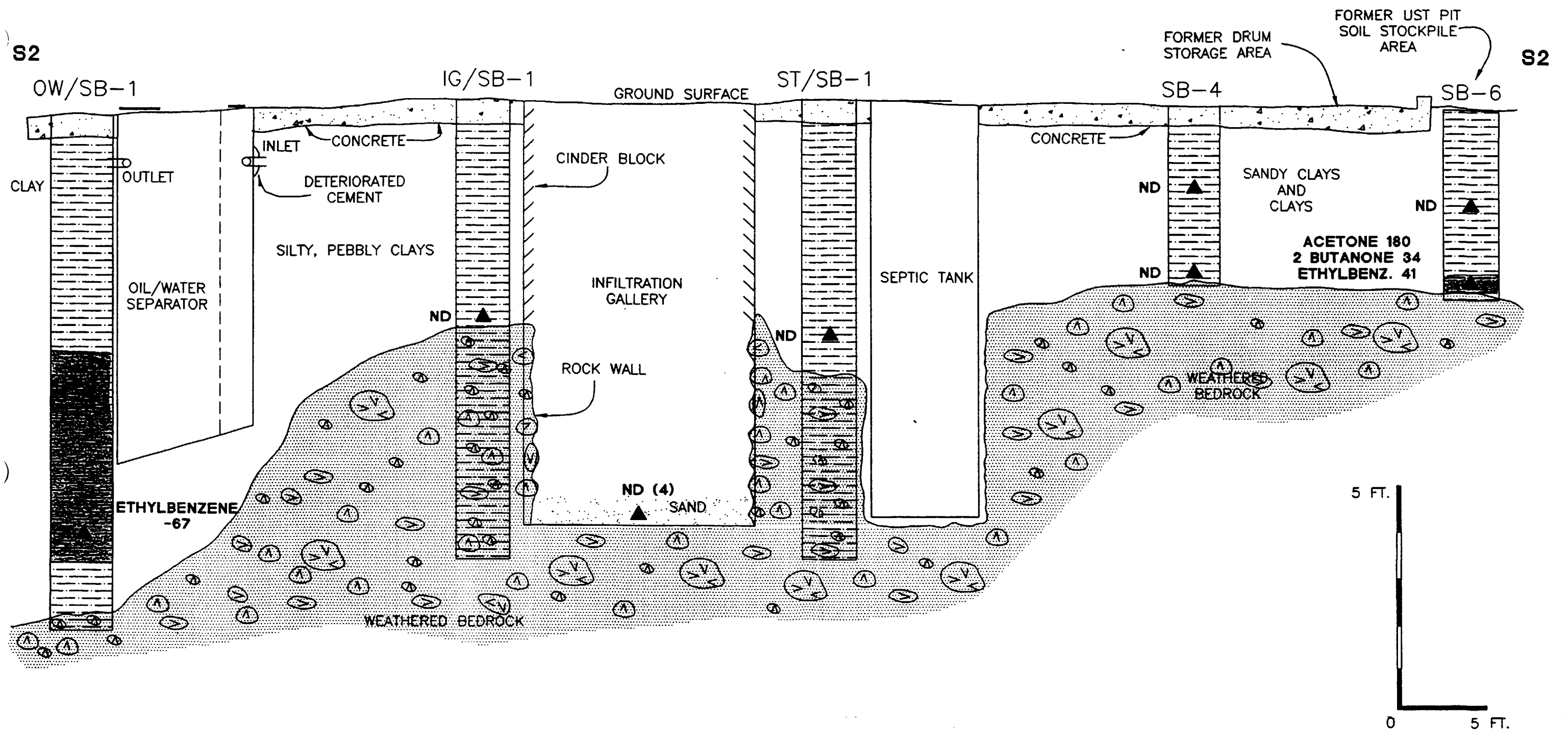
AUTHOR: L.J.M.

DRAWN BY: HCC

CK'D BY: L.J.M.

FILE: S-1.DWG

FIGURE 8
TEXACO TUTU
SERVICE STATION
SOIL BORINGS
CROSS-SECTIONS S1-S1'



- ▲ ANALYTICAL SAMPLE (SOIL)
- ND = NON-DEFECT
- WASTE OIL STAINING AND PID "HITS"
- (67) CONCENTRATIONS (ppb) IN SOIL SAMPLES

GCL



FIGURE 9
TEXACO TUTU SERVICE STATION
SOIL BORINGS
CROSS-SECTION S2-S2'

CLIENT: TEXACO TUTU	
AUTHOR: L.J.M.	DATE: 4/11/94
DRAWN BY: HCC	REV. NO.: 1
CHECKED BY: L.J.M.	FILE: S-2.DWG

5.0 RESULTS OF CHEMICAL ANALYSES

5.1 SOIL CHEMISTRY

Soil samples were collected from soil and monitor well borings and the bottom of the infiltration gallery. These samples were submitted for laboratory analysis for VOCs using Environmental Protection Agency Method 8240. Figure 10 presents summaries of all soil analyses from this investigation, which are also summarized on Table 3 and detailed in Appendix F.

The only constituents detected in the soil samples analyzed from the Texaco site were petroleum hydrocarbon constituents (BTEX and MTBE) associated with gasoline leakage from the old UST tank site, and petroleum hydrocarbon constituents (ethylbenzene) associated with waste oils that stain shallow soils near the oil/water separator, SB-1 (west service bay), and SB-6 (former UST pit soil stockpile area). Other constituents detected included carbon disulfide, acetone, and 2-butanone. HVOCs were not detected in any of the soil samples on site submitted for laboratory analysis. It was not possible to sample soils in the TT-6 well boring in the Four Winds Shopping Center parking lot because the soil horizon was only 1.5 feet thick.

5.1.1 OLD UNDERGROUND STORAGE TANK PIT

Gasoline-related constituents are confined to the south half of the Texaco site, and emanate from the original UST leakage point at the location of TT-4. Imported soils used to fill the old UST pit have been impacted by low levels of residual BTEX constituents (36 to 62 parts per billion, or ppb) from the pit area, as are shallow soils (above 10 feet) in the vicinity of the TT-1 well cluster (31 to 186 ppb). There were no measurable readings of VOCs with the PID during drilling of the saprolith under the soils impacted by the gasoline.

5.1.2 SERVICE BAY SUMPS

The service bay sumps measured approximately 2 feet by 2 feet wide and 3 feet deep and are constructed of concrete. Soil borings were placed approximately 2 feet from the southwest corner of each sump (Figure 3). The sump adjacent to SB-3 (east service bay) had a slight gap between the concrete wall and base, but analysis of soils in SB-3 showed no detectable VOCs. The sump adjacent to SB-2 (middle service bay) appeared to be fully intact, and soil samples were also free of VOCs. GCL discovered a freshwater leak from the service station's water line that entered the west service bay sump through a small crack around the discharge outlet port. Soil at the base of SB-1 adjacent to this sump showed a "J" value for ethylbenzene at 13 ppb. This impact was limited to a few inches at the bottom of the borehole near the contact with the underlying saprolith zone (Figure 8).

5.1.3 DRUM STORAGE AREA

Two soil borings (SB-4 and SB-5) were advanced in the former waste oil drum areas along the north and east sides of the site (Figure 3). These borings are located in areas paved with concrete. In addition, boring SB-6 was drilled in the unpaved area along the north fence where soils from the excavated UST pit were stockpiled and vented. Boring SB-4 encountered weathered bedrock at 3.8 feet below the surface. VOCs were not detected in soil samples analyzed from 2.5 and 3.8 feet in this boring. Boring SB-5 encountered saprolith at 2.5 feet. A soil sample from above the soil-saprolith contact also did not show any VOCs on analysis. Boring SB-6 intersected the saprolith at 3.8 feet. Soils in the basal few inches of this boring were stained with heavy waste oil, and analyses showed low levels of ethylbenzene (41 ppb), acetone (180 ppb), and 2-butanone (34 ppb).

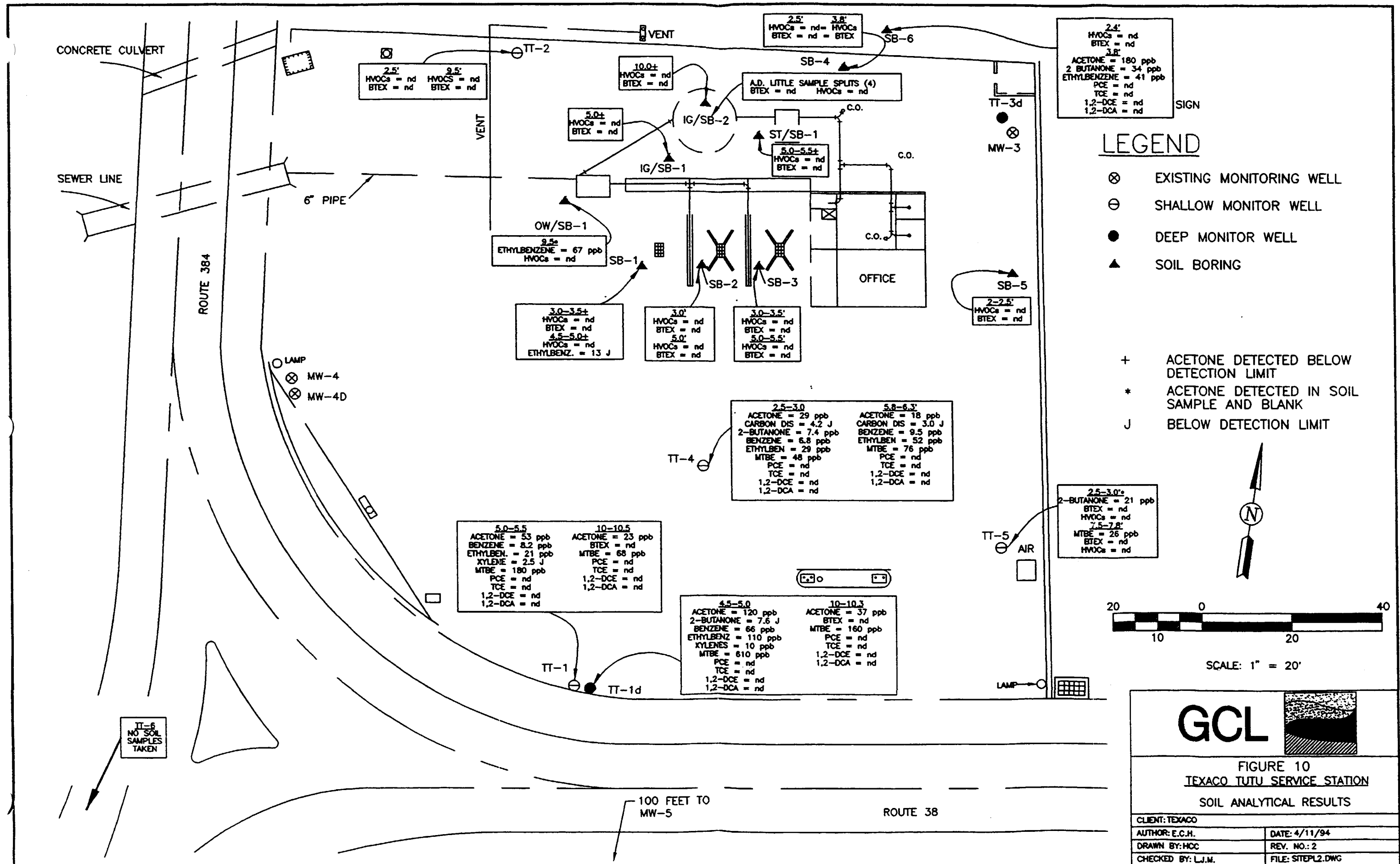


Table 3
Analytical Results Summary for Soil Samples
Texaco Tutu, December 1993

Location/ Sample #	Matrix	Sample Interval	Field PID Headspace (ppm)	Volatile Organic Compounds (Method 8240)	Result	Units	Reporting Limits*	Units
SB - 1 9311301630	Soil	3.0' - 3.5'	0	Acetone	8.6	J ug/Kg	12	ug/Kg
SB - 1 9311301710	Soil	4.5' - 5.0'	0	Acetone Ethylbenzene	32 13	JD ug/Kg JD ug/Kg	61 30	ug/Kg ug/Kg
SB - 2 9311301054	Soil	3.0'	0	ND				
SB - 2 9311301144	Soil	4.9' - 5.2'	0	ND				
SB - 3 9311301355	Soil	3.0' - 3.5'	0	ND				
SB - 3 9311301505	Soil	5.0' - 5.5'	0	ND				
SB - 4 9312021045	Soil	2.5'	0	ND				
SB - 4 9312021050	Soil	3.8'	0	ND				
SB - 5 9312041320	Soil	2.0' - 2.5'	0	ND				
SB - 6 9312041550	Soil	2.4'	0	ND				
SB - 6 9312041555	Soil	3.8'	9.0	Acetone 2-Butanone Ethylbenzene	180 34 41	ug/Kg ug/Kg ug/Kg	13 13 6.5	ug/Kg ug/Kg ug/Kg
IG/SB-1 9312011800	Soil	5.0'	0.4	Acetone	2.9	J ug/Kg	12	ug/Kg
IG/SB-2 (btm of tank) 9312021235	Soil	0.8' - 1.5'	NA due to high moisture	Acetone	5.6	J ug/Kg	13	ug/Kg
ST/SB-1 9312011400	Soil	5.0' - 5.5'	0	Acetone	3.4	J ug/Kg	12	ug/Kg

Table 3 (cont'd)
Analytical Results Summary for Soil Samples
Texaco Tutu, December 1993

Location/ Sample #	Matrix	Sample Interval	Field PID Headspace (ppm)	Volatile Organic Compounds (Method 8240)	Result	Units	Reporting Limits*	Units
OW/SB - 1 9312041000	Soil	9.5'	35.0	Acetone Ethylbenzene	40 67	B ug/Kg ug/Kg	12 6.2	ug/Kg ug/Kg
TT - 1 9312080930	Soil	5.0' - 5.5'	94.0	tert-Butyl Methyl ether Acetone Benzene Ethylbenzene Xylene (total)	180 53 8.2 21 2.5	D ug/Kg ug/Kg ug/Kg ug/Kg J ug/Kg	11 11 5 5.5 5.5	ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg
TT - 1 9312080935	Soil	5.0' - 5.5' Duplicate	94.0	tert-Butyl Methyl ether Acetone Benzene Ethylbenzene Xylene (total)	170 48 5.0 18 2.5	ug/Kg ug/Kg J ug/Kg ug/Kg J ug/Kg	5.6 11 5.6 5.6 5.6	ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg
TT - 1 9312080940	Soil	10.0' - 10.5'	19.0	tert-Butyl Methyl ether Acetone	68 23	ug/Kg ug/Kg	5.4 11	ug/Kg ug/Kg
TT - 1d 9312071030	Soil	4.5' - 5.0'	293.0	tert-Butyl Methyl ether Acetone 2-Butanone Benzene Ethylbenzene Xylene (total)	610 120 7.6 66 110 10	D ug/Kg ug/Kg J ug/Kg ug/Kg ug/Kg ug/Kg	29 12 12 5.8 5.8 5.8	ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg
TT - 1d 9312071033	Soil	4.5' - 5.0' Duplicate	293.0	tert-Butyl Methyl ether Acetone 2-Butanone Benzene Ethylbenzene Xylene (total)	460 90 6.9 69 140 13	D ug/Kg ug/Kg J ug/Kg ug/Kg ug/Kg ug/Kg	33 13 13 6.6 6.6 6.6	ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg
TT - 1d 9312071140	Soil	10.0' - 10.3'	41.0	tert-Butyl Methyl ether Acetone	160 37	ug/Kg ug/Kg	5.4 11	ug/Kg ug/Kg
TT - 2 9312041100	Soil	2.5'	42.0 Moist	ND				
TT - 2 9312041130	Soil	9.5'	Not Taken	ND				

5.1.4 OIL/WATER SEPARATOR, INFILTRATION GALLERY, AND SEPTIC TANK

Inspection of the interior of the oil/water separator showed some deterioration of the concrete wall around the inlet and outlet pipes that lead to the various waste management units, particularly those that lead to the service bay sumps and infiltration gallery. The concrete base of the unit could not be inspected because of the presence of a thin layer of sludge after pumpout. A sample of the water that filled the unit was submitted for analysis prior to cleanout. That sample showed no detectable VOCs (Table 4). Soil staining was found in adjacent boring OW/SB-1 at depths of 6 to 10 feet below the surface, above the contact with the saprolith (Figure 9). A soil sample submitted for analysis from 9.5 feet showed 67 ppb ethylbenzene. No other VOCs were detected other than 40 ppb acetone, which was also detected in the method blank.

The interior of the infiltration gallery was visually inspected through an opening jackhammered through the concrete cover of the unit. The unit was found to be free of any fluids, although the base course sand was very moist. Samples of this sand that were analyzed by GCL and split samples analyzed in conjunction with A. D. Little and Associates, showed no detectable VOCs (Table 5). The soil sample from adjacent boring IG/SB-1 showed no detectable VOCs (Figure 9). That sample was obtained from the interface between the clayey soils and saprolith at 5 feet below the surface. The base of the infiltration gallery was measured at 10 feet below the surface.

The septic tank was pumped out and visually inspected. It was found to be constructed of concrete and appeared to be fully intact. The water pumped from the unit did not have any discernible odor or sheen. The base of this unit was measured at 9 feet below

the surface. A soil sample from 5 feet in adjacent boring ST/SB-1 was analyzed and did not contain any detectable VOCs.

5.1.5 WASTE OIL DRUMS

Arthur D. Little and Associates conducted additional activities at the site during GCL's field investigation. Activities included selected sampling of existing waste drums, not including cuttings and fluids recovered from the current soil borings and monitor well. GCL provided field oversight of these activities and obtained splits of all samples collected by Arthur D. Little and Associates.

Most of the 46 waste drums on site were field-screened for VOCs by Arthur D. Little using a Dexsil-Clor-D-Tect Q4000 Quantitative test kit with a specified range of 200 to 4,000 parts per million (ppm). Results of this field screening are summarized in Table 5. Arthur D. Little selected several drums for individual and composite sampling for analysis by Environmental Protection Agency Method 8240 (including xylenes). Results of those analyses are summarized in Table 6 and detailed in Appendix G. BTEX compounds, primarily the toluene, ethylbenzene, and xylene constituents, were found in two individual drums and the three-drum composite sample. The HVOC compounds 1,1,1-TCA and PCE were found in one drum (drum 513) at concentrations of 77 ppm and 56 ppm, respectively.

5.2 GROUNDWATER CHEMISTRY

Groundwater samples were collected from each new monitor well after development and existing monitor wells MW-3, MW-4, and MW-4d on site. These samples were submitted for analysis using Environmental Protection Agency Method 8240. A summary of groundwater analytical results is provided in Table 4

Table 4

**Analytical Results Summary for Water Samples
Texaco Tutu, December 1993**

Location/ Sample #	Matrix	Volatile Organic Compounds (Method 8240)	Result	Units	Reporting Limits*	Units
TT - 1 9312101540	Water	Benzene	16000	ug/L	2500	ug/L
		Ethylbenzene	3000	ug/L	2500	ug/L
		tert-Butyl Methyl ether	27000	ug/L	2500	ug/L
		Methylene Chloride	7100	ug/L	2500	ug/L
		Toluene	13000	ug/L	2500	ug/L
		Xylene (total)	16000	ug/L	2500	ug/L
TT - 1 9312101545	Water Duplicate	Benzene	17000	ug/L	2500	ug/L
		Ethylbenzene	2900	ug/L	2500	ug/L
		tert-Butyl Methyl ether	27000	ug/L	2500	ug/L
		Methylene Chloride	7000	ug/L	2500	ug/L
		Toluene	13000	ug/L	2500	ug/L
		Xylene (total)	16000	ug/L	2500	ug/L
TT - 1d 9312101445	Water	Acetone	200	ug/L	120	ug/L
		Benzene	1600	ug/L	62	ug/L
		1,2-Dichloroethane	33 J	ug/L	62	ug/L
		1,2-Dichloroethene (cis/trans)	330	ug/L	62	ug/L
		Ethylbenzene	65	ug/L	62	ug/L
		tert-Butyl Methyl ether	1500	ug/L	62	ug/L
		Methylene Chloride	160	ug/L	62	ug/L
		Tetrachloroethene	58 J	ug/L	62	ug/L
		Toluene	260	ug/L	62	ug/L
		Trichloroethene	22 J	ug/L	62	ug/L
		Vinyl Chloride	22 J	ug/L	120	ug/L
		Xylene (total)	620	ug/L	62	ug/L
TT - 2 9312101115	Water	Benzene	1.0 J	ug/L	5	ug/L
		Chloroform	1.4 J	ug/L	5	ug/L
		1,2-Dichloroethene (cis/trans)	210	ug/L	5	ug/L
		tert-Butyl Methyl ether	3.0 J	ug/L	5	ug/L
		Methylene Chloride	7.8	ug/L	5	ug/L
		Tetrachloroethene	30	ug/L	5	ug/L
		Toluene	1.2 J	ug/L	5	ug/L
		Trichloroethene	10	ug/L	5	ug/L
TT - 3d 9312100905	Water	1,2-Dichloroethene (cis/trans)	520	ug/L	25	ug/L
		Methylene Chloride	63	ug/L	25	ug/L
		Tetrachloroethene	43	ug/L	25	ug/L
		Trichloroethene	33	ug/L	25	ug/L
		Vinyl Chloride	150	ug/L	50	ug/L
TT - 4 9312101230	Water	Acetone	1700 J	ug/L	5000	ug/L
		Benzene	23000	ug/L	2500	ug/L
		Ethylbenzene	3000	ug/L	2500	ug/L
		tert-Butyl Methyl ether	52000	ug/L	2500	ug/L
		Methylene Chloride	7000	ug/L	2500	ug/L
		Toluene	25000	ug/L	2500	ug/L
		Xylene (total)	17000	ug/L	2500	ug/L

Table 4 (cont'd)

**Analytical Results Summary for Water Samples
Texaco Tutu, December 1993**

Location/ Sample #	Matrix	Volatile Organic Compounds (Method 8240)	Result	Units	Reporting Limits*	Units
TT - 5 9312101010	Water	Benzene	9.1	J ug/L	10	ug/L
		1,2-Dichloroethene (cis/trans)	280	ug/L	10	ug/L
		Ethylbenzene	11	ug/L	10	ug/L
		tert-Butyl Methyl ether	90	ug/L	10	ug/L
		Methylene Chloride	23	ug/L	10	ug/L
		Tetrachloroethene	31	ug/L	10	ug/L
		Toluene	13	ug/L	10	ug/L
		Trichloroethene	47	ug/L	10	ug/L
		Vinyl Chloride	42	ug/L	20	ug/L
		Xylene (total)	22	ug/L	10	ug/L
TT - 6 9312111130	Water	Acetone	15	ug/L	10	ug/L
		Benzene	2.1	J ug/L	5	ug/L
		Chloroform	4.3	J ug/L	5	ug/L
		1,2-Dichloroethene (cis/trans)	180	ug/L	5	ug/L
		tert-Butyl Methyl ether	150	ug/L	5	ug/L
		Methylene Chloride	8.7	ug/L	5	ug/L
		Tetrachloroethene	48	ug/L	5	ug/L
		Trichloroethene	15	ug/L	5	ug/L
MW - 3 9312071430	Water	Vinyl Chloride	56	ug/L	50	ug/L
		1,2-Dichloroethene (cis/trans)	140	ug/L	25	ug/L
		Trichloroethene	12	J ug/L	25	ug/L
		Benzene	6.2	J ug/L	25	ug/L
		Tetrachloroethene	7.6	J ug/L	25	ug/L
		Toluene	6.4	J ug/L	25	ug/L
		Chlorobenzene	6.7	J ug/L	25	ug/L
MW - 4 9312071000	Water	tert-Butyl Methyl ether	110	ug/L	5	ug/L
		Acetone	45	ug/L	10	ug/L
		1,2-Dichloroethene (cis/trans)	43	ug/L	5	ug/L
		Trichloroethene	3.4	J ug/L	5	ug/L
		Benzene	17	ug/L	5	ug/L
		Tetrachloroethene	5.2	ug/L	5	ug/L
		Toluene	1.2	J ug/L	5	ug/L
		Chlorobenzene	1.0	J ug/L	5	ug/L
		Xylene (total)	2.6	J ug/L	5	ug/L
MW - 4d 9312091245	Water	Benzene	9.4	J ug/L	10	ug/L
		Chloroform	5.4	J ug/L	10	ug/L
		1,2-Dichloroethene (cis/trans)	270	ug/L	10	ug/L
		Ethylbenzene	5.2	J ug/L	10	ug/L
		tert-Butyl Methyl ether	4.1	J ug/L	10	ug/L
		Methylene Chloride	23	ug/L	10	ug/L
		Tetrachloroethene	52	ug/L	10	ug/L
		Toluene	19	ug/L	10	ug/L

Table 4 (cont'd)

**Analytical Results Summary for Water Samples
Texaco Tutu, December 1993**

Location/ Sample #	Matrix	Volatile Organic Compounds (Method 8240)	Result	Units	Reporting Limits*	Units
		Trichloroethene	14	ug/L	10	ug/L
		Xylene (total)	26	ug/L	10	ug/L
Oil/Water Separator 9312011240	Water	ND				
Waste Water Tank 1 9312111645	Water	Benzene	1000	ug/L	120	ug/L
		1,2-Dichloroethene (cis/trans)	46 J	ug/L	120	ug/L
		tert-Butyl Methyl ether	3400	ug/L	120	ug/L
		Methylene Chloride	340	ug/L	120	ug/L
		Toluene	200	ug/L	120	ug/L
		Xylene (total)	510	ug/L	120	ug/L
Waste Water Tank 2 9312111650	Water	Acetone	100	ug/L	50	ug/L
		Benzene	150	ug/L	25	ug/L
		Ethylbenzene	60	ug/L	25	ug/L
		tert-Butyl Methyl ether	630	ug/L	25	ug/L
		Methylene Chloride	61	ug/L	25	ug/L
		Toluene	13 J	ug/L	25	ug/L
		Xylene (total)	740	ug/L	25	ug/L

ND = Not Detected

G:\54173\TXDAT3SM.WQ2

J = Result is detected below the reporting limit or is an estimated concentration.

D = All reporting limits raised due to matrix interferences.

B = Compound is detected in the blank.

*Reporting limits are the lowest concentration of analytes that can be reliably determined within specified limits of precision and accuracy under routine laboratory operating conditions.

Table 5
Summary of Waste Oil Drums Field Screening, Arthur D. Little Texaco Tutu Investigation
December 1993

Drum #	Location	ADL Field Screen (ppm)	Hnu (ppm)	Comments	Drum #	Location	ADL Field Screen (ppm)	Hnu (ppm)	Comments
500	West Wall	---		empty	523 *C	East Wall	500	2	oil
501	West Wall	400		oil	524	East Wall	0	9	oil/water
502	West Wall	400	60	oil	525	East Wall	200		oil
503	West Wall	---		empty	526	East Wall	300		
504	West Wall	0	35	oil	527	East Wall	300	30	
505	West Wall	200	25	oil	528	East Wall	---		solids
506	West Wall	200	20	oil	529	East Wall	100	5	
507 *C	West Wall	600	20	labeled grease	530	East Wall	? 800	4	solids
508	West Wall	0	20	labeled grease	531	East Wall	300		
509	West Wall	0		oil	532	East Wall	---		can't open
510	West Wall	100		oil	533	East Wall	200		oil/water
511	West Wall	500	50	oil	534 *	East Wall	800		oil/water
512	West Wall	300		oil	536	East Wall	---		can't open
513 *	West Wall	600		oil	537	East Wall	200	40	oil/adsorb pads
514	West Wall	0		oil	538	East Wall	---	14	soil/trash
515	West Wall	0		oil	539	East Wall	---		adsorb pads
516	East Wall	---	4	stained soil	540	East Wall	---		can't open
517	East Wall	---	0	mix, H2O/oil	541	East Wall	200		mix
518	East Wall	300	2.5	mix	542	East Wall	---	2	adsorb pads
519 *C	East Wall	600	9	mix	543	North Wall	---	0	used sample equip.
520	East Wall	200		oil odor	544 *	North Wall	600	6	oil
521	East Wall	0	70	oil odor	545	North Wall	---	0	adsorb pads
522	East Wall	---		bulging, not opened	546	North Wall	300	4	oil

* Drum selected for individual sample

*C Drum selected for composite sample

West wall location = Drums stored along north side of north canopy on pallets

East wall location = Drums stored along east retaining wall

North wall location = Drums stored along wall at northeast corner of property

O:\54153\oil\drum.wq1

Table 6

Arthur D. Little Dec. 93 Sampling, Split Sample Analytical Results

Location	Matrix	Depth	Volatile Organic Compounds (Method 8240)	Result	Units	Reporting Limits*	Units
Infil. Tank Bottom 9312110950	Soil	0" - 3" 1st	ND				
Infil. Tank Bottom 9312111025	Soil	0" - 3" 2nd	ND				
Infil. Tank Bottom 9312111100	Soil	0" - 8" 3rd	ND				
Infil. Tank Bottom 9312111135	Soil	0" - 8" 4th	ND				
Drum 544 9312130945	Waste Oil	NA	Methylene Chloride Acetone Benzene Toluene Ethylbenzene Xylene (total)	2.6 1.9 J 0.22 J 1.8 4.7 19	Mg/Kg Mg/Kg Mg/Kg Mg/Kg Mg/Kg Mg/Kg	1.0 2.0 1.0 1.0 1.0 1.0	Mg/Kg Mg/Kg Mg/Kg Mg/Kg Mg/Kg Mg/Kg
Drums 519,523,507 9312130955	Waste Oil	NA	Methylene Chloride Benzene Toluene Ethylbenzene Xylene (total)	7.8 2.5 J 160 15 49	Mg/Kg Mg/Kg Mg/Kg Mg/Kg Mg/Kg	5 5 5 5 5	Mg/Kg Mg/Kg Mg/Kg Mg/Kg Mg/Kg
Drum 534 9312131010	Waste Oil	NA	Methylene Chloride Toluene Ethylbenzene Xylene (total)	1.2 0.16 0.62 1.2	Mg/Kg Mg/Kg Mg/Kg Mg/Kg	0.5 0.5 0.5 0.5	Mg/Kg Mg/Kg Mg/Kg Mg/Kg
Drum 513 9312131040	Waste Oil	NA	1,1,1-Trichloroethane Tetrachloroethene Toluene Ethylbenzene Xylene (total)	77 56 550 150 1200	Mg/Kg Mg/Kg Mg/Kg Mg/Kg Mg/Kg	50 50 50 50 50	Mg/Kg Mg/Kg Mg/Kg Mg/Kg Mg/Kg
MW - 3 9312131420	Water	NA	Nitrate + Nitrite as N	0.38	Mg/L	0.050	Mg/L

ND = Not Detected

G:\54153\ADLSPTSM.WQ2

J = Result is detected below the reporting limit or is an estimated concentration

*Reporting limits are the lowest concentration of analytes that can be reliably determined within specified limits of precision and accuracy under routine laboratory operating conditions.

and Figure 11, and detailed analytical sheets are included in Appendix H. In addition, Figures 12a and 12b show the shallow and deep zone dissolved BTEX plumes, respectively, under and south of the Texaco site.

5.2.1 PETROLEUM-RELATED CONTAMINANTS

Petroleum-related constituents were detected in shallow monitor wells at and south of the site. No free-phase hydrocarbons were measured in any of the wells. The highest dissolved BTEX concentrations were found in shallow monitor well TT-4 (68,000 ppb), which was drilled in the middle of the old UST pit where petroleum discharge occurred. BTEX concentrations in the shallow zone are as high as (48,000 ppb) in TT-1, but diminish abruptly toward TT-5 (55 ppb) to the east, MW-4 to the west (22 ppb), and TT-2 (5 ppb) and MW-3 (12 ppb) to the north (Figure 12a). Benzene concentrations in the shallow zone range from 1 ppb (a "J" value in TT-2) to 23,000 ppb in TT-4. TT-6, a shallow zone well in the Four Winds Shopping Center parking lot, showed a total BTEX concentration of 2.1 ppb, which was entirely a benzene "J" value. BTEX was not detected in MW-6 or MW-7 during the most recent sampling of those wells. MW-6 provides closure of the BTEX plume to the west, and MW-7 provides closure to the southeast. The center of mass of the shallow aquifer BTEX plume in the area of the Tutu station appears to be directly under the south end of the Texaco site (Figure 12a).

BTEX concentrations in deep monitor wells on site range from non-detects to 2,545 ppb (in TT-1d). The most recent analysis from the Tillett supply well showed a total BTEX concentration of 7 ppb, whereas the most recent sample from MW-6d was non-detect for BTEX. BTEX contamination in the deeper aquifer likewise appears to be centered close to the Texaco site (Figure 12b).

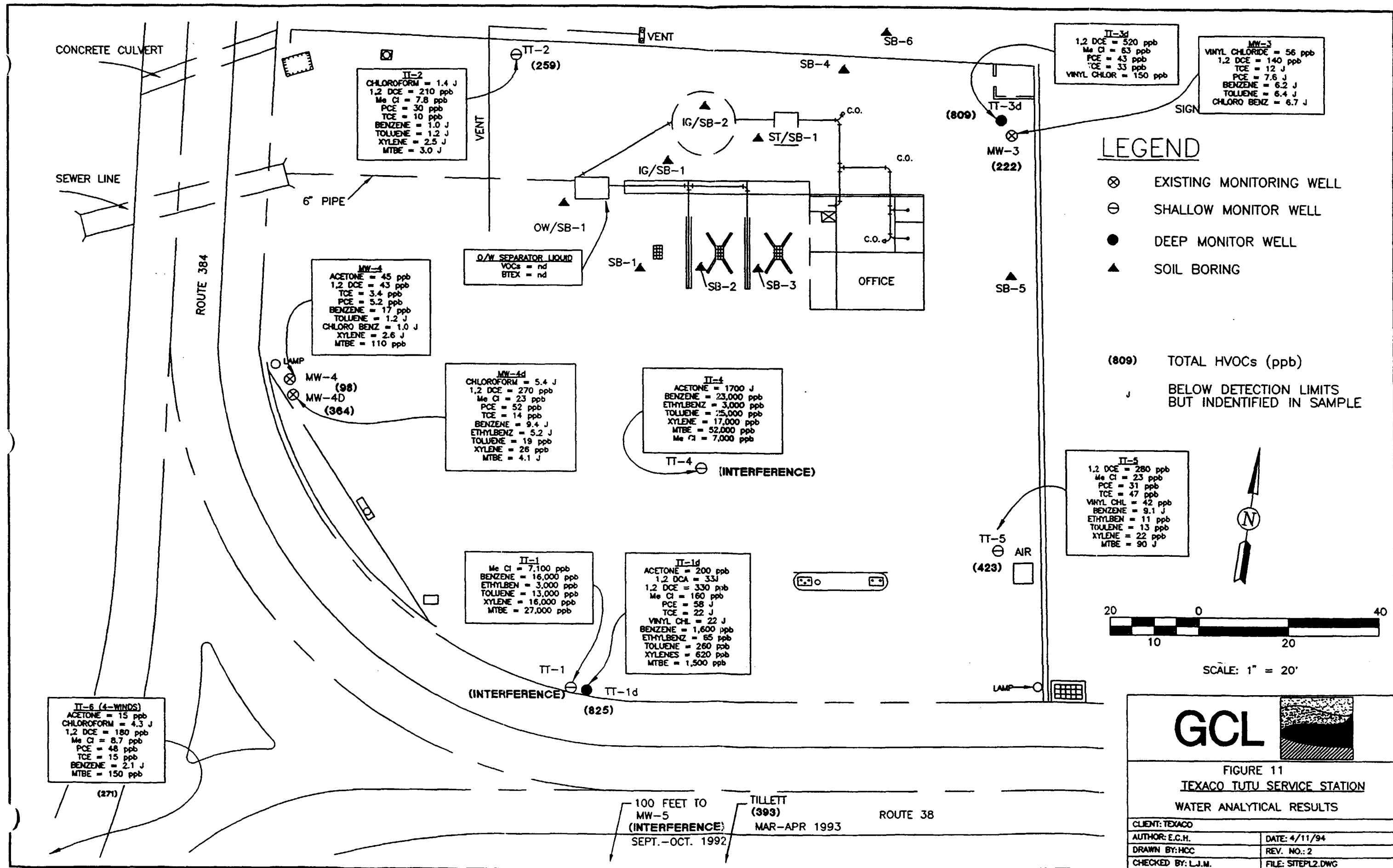
MTBE concentrations in the shallow zone range from 0 ppb (MW-3) to 52,000 ppb (TT-4) under the site, and 150 ppb in TT-6 (table 4). The only deep well in which MTBE exceeded "J" values was TT-1d (1,500 ppb), under the Texaco site. MTBE is a gasoline additive that is commonly associated with BTEX constituents in product releases. There are currently no Federal or territorial standards for MTBE in groundwater.

5.2.2 HALOGENATED VOLATILE ORGANIC COMPOUNDS

HVOCs were detected in deep and shallow groundwater under the site and in shallow groundwater in TT-6. The primary compounds detected were 1,2 dichloroethene (DCE), trichloroethene (TCE), tetrachloroethene (PCE), and vinyl chloride, constituents found in groundwater throughout the Tutu Gut area. In addition, acetone, methylene chloride, chlorobenzene, and chloroform were also detected in some wells (Figure 11).

The compound with the highest concentration in both deep and shallow groundwater was 1,2 DCE. Its concentration ranged from 43 to 280 ppb in shallow groundwater and from 270 to 520 ppb in deep groundwater wells under the site (Figure 11 and Table 4). HVOC concentrations in shallow monitor wells TT-1 and TT-4 may have been masked by interference of BTEX constituents.

Total HVOC concentrations under the site were higher in the deep monitor wells than in the shallow wells (Figure 11). Concentrations in the deep wells ranged from 364 ppb (MW-4d) to 825 ppb (TT-1d), whereas those in shallow wells ranged from 97 ppb (MW-4) to 423 ppb (TT-5). The total HVOC concentration in TT-6 in the Four Winds Shopping Center parking lot was 271 ppb.



**5.2.3 QUALITY ASSURANCE/QUALITY CONTROL
ANALYTICAL RESULTS**

Low levels of organic compounds were detected in QA/QC samples by the laboratory. The QA/QC analytical results are presented in Appendix I.

Acetone and carbon disulfide were detected in a rinsate sample from the hand auger bucket after equipment decontamination. These compounds were detected at 2.8 and 4.2 ppb, respectively, and were assigned J values by the laboratory.

Carbon disulfide was detected in one field blank. It was detected at 1.6 ppb and assigned a J value.

Acetone, xylene, and methylene chloride were detected in three trip blanks. They were detected at 1.9, 1.5, and 7.9 ppb respectively. The acetone and xylene were assigned J values by the laboratory.

Acetone was detected in one method blank. It was detected at 2.4 ppb, and assigned a J value by the laboratory.

6.0 INTERPRETATION AND DISCUSSION OF ANALYTICAL RESULTS

6.1 SOIL IMPACTS

The investigation of the unsaturated zone at the Texaco site focussed on impacts related to releases of petroleum product from the former UST pit site, and potential releases of oily wastes and HVOCs from various waste management units. The native soil under the site appears to consist of moderately plastic, sandy clay to highly plastic clay. The underlying saprolith is composed of intensely weathered volcanic bedrock and has a high proportion of moderately plastic clay matrix. Field observations suggest that both the soil and the saprolith appear to be capable of retarding transport of heavier hydrocarbons.

6.1.1 PRODUCT RELEASES

Soils in and around the former UST pit site appeared to be impacted by petroleum product-related constituents possibly due to product leakage from the original USTs or from related plumbing. BTEX concentrations were greatest in soils analyzed from 5 feet in TT-1d, but do not appear to extend below 10 feet in the affected area. The old UST pit and the area around it were previously excavated and replaced with gravelly clay obtained from an off-site source. This gravelly fill was also impacted by product that probably remained in the soil surrounding the excavation.

The depth to bedrock in the area of the old UST pit is approximately 16 to 17 feet, which is at least 7 feet below the base of the excavated pit. The bedrock underlying the TT-1 well cluster location is approximately 22 feet below the surface. The thickness of the saprolith at these locations ranges from 5 to 7 feet. Gasoline may have been able to penetrate the saprolith and enter the fractured bedrock aquifer at this location because the saprolith may be more permeable to lighter hydrocarbons than to heavier waste oil or water.

HVOCs were clearly not released from the USTs.

6.1.2 WASTE MANAGEMENT UNITS

All the waste management units at the site were inspected for structural integrity to determine their potential for release of contaminants to the soil and underlying groundwater aquifer. None of the units have been in service since 1992. The three service bay sumps were drained and sediment shoveled out prior to inspection.

Although an apparent breach was found between a wall and the concrete floor of the east service bay sump, soil sampling adjacent to this unit in SB-3 show that soils were not impacted from this breach. The middle service bay appeared intact, and its adjacent soil boring also free from impact. An underground water line leak near the west service bay may have facilitated release of heavy oil from a breach around the outlet pipe in that sump, but impact was limited to a few inches above the soil/saprolith contact. The saprolith itself did not appear to be impacted. Depth to bedrock at this location is approximately 15 feet below the surface. The thickness of saprolith here is approximately 10 feet.

The oil/water separator was visually inspected after cleanout and found to be intact except for some deterioration of concrete around inlet and outlet pipes that run to the service bay sumps and infiltration gallery, respectively. A soil boring placed on the southwest (down-slope) side of this unit showed soil staining to a depth below the base of the separator, but no impact to the underlying saprolith. Bedrock at that boring location is estimated at 17 feet below the surface, with at least 6 feet of saprolith below the impacted soil. The staining was probably the result of release of waste oil from the breached concrete around

the inlet pipe from the west service bay sump, which may have migrated a short distance through the soil under the influence of water that was leaking from the underground water supply pipe. There is no evidence that the waste oil here has penetrated below to the saprolith.

The interior of the infiltration gallery did not contain any fluid at the time of this investigation, and the walls of the unit appeared intact. A total of five separate samples of sediment taken from the base of this unit were analyzed for VOCs, but no VOCs were detected in any of the samples. The base of the infiltration gallery (10 feet below the surface) is below the soil/saprolith contact, which at this location is at approximately 7 to 8 feet below the surface. Depth to bedrock here is approximately 14 feet below the surface, which is 4 feet below the known base of the unit. There is currently no evidence that VOCs reside in the infiltration gallery, although low concentrations of petroleum hydrocarbon-related compounds were detected in previous sampling events by others (Geraghty and Miller, 1993a). No HVOCs were ever reported in wastewater samples from the infiltration gallery. The infiltration gallery was designed to allow wastewater to penetrate the saprolith. This may have carried low concentrations of petroleum hydrocarbon contaminants into groundwater in the past.

The septic tank was measured at 9 feet deep after it was drained of what appeared to be relatively clean water. No evidence of staining was found in the soil or saprolith in adjacent boring ST/SB-1, and analyses of soil from above the soil/saprolith contact did not reveal any detectable VOCs. Bedrock under this unit is approximately 13 feet below the surface, and the overlying saprolith is approximately 6 feet thick. It does not appear this unit

has ever contributed contaminants to the soil, saprolith, or fractured bedrock.

Minor oil staining encountered in boring SB-6 was restricted to a very thin zone in the soil that directly overlays the saprolith. Contaminants analyzed from the soil sample included ethylbenzene, acetone, 2-butanone, and carbon disulfide. It is likely that the ethylbenzene was derived from UST pit soils that were stockpiled at this location prior to their removal from the site. The soil here was excavated and replaced during installation of the municipal sewer hookup to the service station in 1992. The acetone and 2-butanone are most likely ambient (airborne) contaminants that are common combustion products of auto engine exhaust, or laboratory contaminants. Carbon disulfide is a common product of bio-organic emissions from soil. It was not possible to determine if this impact extended down into the underlying saprolith because it was not possible to site the drill rig over the hand-augered hole due to obstructions. However, based on soil impacts observed in other boreholes where the saprolith was penetrated (e.g., UST area, OW/SB-1, SB-1), penetration of this impact through the saprolith in SB-6 is not expected. The saprolith here is approximately 7.5 feet thick.

6.1.3 WASTE OIL DRUMS

Soils beneath the former drum storage areas sampled by borings SB-4 and SB-5 did not appear to be impacted by any spillage waste oil drums. Laboratory analyses of composite samples from selected waste oil drums, collected by Arthur D. Little and split by GCL during the field investigation, are dominated by BTEX constituents, although one composite sample showed 133 ppm total HVOCs (1,1,1-TCA and PCE). Although these solvents may have been present in the small

quantities of commercial engine degreasers and solvents that may have been used at the site, there is no evidence that these compounds are present in site soils or the base course sand of the infiltration gallery on site.

6.2 GROUNDWATER IMPACTS

6.2.1 SUBSURFACE PERMEABILITY ZONATION

Groundwater gradients in the vicinity of the Texaco site are strongly controlled by vertical fractures in the non-weathered, volcanic bedrock, and are generally to the south under the Texaco Tutu site (Figures 12a and 12b). The most transmissive fractures appear to be below the saprolith/bedrock contact. Although static water levels in the new monitor wells are above the saprolith/bedrock contact, the saprolith appears to have low permeability and can probably be considered a semi-confining (i.e., "leaky") layer. The onset of water production below the saprolith in the monitor well borings appears to confirm that the saprolith does not contribute significantly to the groundwater budget under the site. The lack of visible impact to the saprolith from waste oil releases at the site suggests that the weathered, clayey saprolith has low permeability and transmissivity to petroleum-related compounds.

6.2.2 BTEX CONTAMINANT TRANSPORT

Shallow and deep groundwater under the Texaco site have been impacted by BTEX contaminants, but BTEX contaminants are more prevalent in shallow groundwater wells at the site. The center of mass of the shallow water BTEX plume related to the release at the Texaco site is confined to within 100 feet from the point of discharge (Figure 12a). BTEX constituents on the upgradient side of the

Texaco site are present only as "J" values in TT-2 and MW-3. Benzene was the only BTEX constituent detected in groundwater in well TT-6, but its concentration there was 2 ppb benzene (a "J" value), which is below Federal standards of 5 ppb. Benzene concentrations above the 5 ppb standard are confined in the shallow aquifer to the area of the plume north of TT-6 (Figure 12a).

BTEX constituents were not detected in deep groundwater on the upgradient side of the Texaco site in TT-3d, and are present only as "J" values in the adjacent shallow monitor well (MW-3). Deep BTEX contamination and benzene concentrations in excess of the 5 ppb standard in the deeper aquifer are limited to the area north of the Tillett supply well and centered immediately south of the Texaco site (Figure 12b).

The current configuration of the shallow water BTEX plume in the area of the Texaco site reflects the strong influence of the Tillett supply well in containing the plume in proximity to the point of release, after the release occurred and before cessation of pumping from that well. The original gasoline release was directed southward toward, and captured by, the Tillett well in response to past pumpage. Capture of the plume by that well inhibited downgradient migration of BTEX from the Texaco release to less than 400 feet from the point of release. This well probably provided additional degradation of the dissolved phase contaminants by turbulent sparging along the producing fractures in the vicinity of the Tillett wellbore. The well is completed open-hole from 15 to 100 feet below the surface. Pumpage from this interval was adequate to cause migration and breakthrough of the plume at this location, and vertical transmission of BTEX constituents deeper into the aquifer. After the Tillett well stopped

pumping, the plume remained relatively stable and more concentrated near the source. Impacted soils around the old UST pit may have provided a low-level, continuing source of additional hydrocarbons after the UST pit was excavated and closed.

6.2.3 HALOGENATED VOLATILE ORGANIC COMPOUND CONCENTRATIONS AND SOURCES

HVOCs were detected in shallow and deep groundwater monitor wells at the Texaco site. Total HVOC concentrations are higher in the deep versus the shallow monitor wells (Figure 11), indicating a moderate, downward vertical gradient under the site. The highest concentration of these compounds in the shallow zone were found in TT-5 on the east side of the site, whereas the lowest total concentration in shallow water was found in MW-4, downgradient from the oil/water separator and infiltration gallery. Concentrations of chlorinated organic compounds are higher in deep groundwater wells. The highest

concentrations on site were found in TT-3d and TT-1d (809 ppb and 825 ppb, respectively), and diminish in MW-4d (364 ppb) upgradient from TT-1d (and downgradient from the oil/water separator).

It is likely that the primary source(s) of HVOCs is from east and possibly north of the Texaco site, and that these constituents migrated vertically down through the aquifer as they advanced downgradient from the source(s), producing higher concentrations at depth. A vertical downward groundwater gradient has been documented in the upper Turpentine Run area (Geraghty & Miller, 1993a). If HVOCs had been derived from the Texaco site, it would be expected that higher concentrations would be found in the shallow aquifer under the site than in the deep aquifer. The lack of any soil source for HVOCs on the Texaco site further indicates that these compounds were not derived from this site, but migrated into groundwater under the site from an off-site source(s).

7.0 CONCLUSIONS

The results of GCL's first phase investigation and analyses of sample splits of waste oil drums and the infiltration gallery at the Texaco Tutu service station show that:

- BTEX compounds are the only constituents detected in soil samples. These constituents are associated with residual contamination from the gasoline discharges from the old UST pit and minor breaches in one service bay sump and the oil/water separator. BTEX constituents include benzene, ethylbenzene, and xylenes in soils close to the old UST release point. Only ethylbenzene is found in soils near the waste management units.
- HVOCs were not detected in any soil samples on the site or samples recovered from the bottom of the infiltration gallery.
- Other VOCs detected in soils, which include acetone, carbon disulfide, and 2-butanone, are most likely ambient (airborne) and/or laboratory contaminants.
- HVOCs were found in one waste oil drum composite sample and may be related to commercial solvents used in small amounts at the site. However, no HVOC compounds were detected in on-site soils, including soils under the drum storage areas.
- BTEX found in groundwater north of TT-6 appears to be attributable to release of gasoline from the old UST pit and associated piping at the Texaco service station. Bedrock structure and vertical fracture systems directed most of the release to the south.
- Natural processes of volatilization and biodegradation effectively attenuated BTEX after less than 400 feet of transport downgradient, aided by pumping and suspected induced sparging in the Tillett supply well when it was still in operation.
- Contamination in excess of 5 ppb benzene extends to a depth of approximately 53 feet below land surface (TT-1d), but is limited to the area north of the Tillett supply well. Deep contamination was not detected down to a depth of 53 feet upgradient on the site (TT-3d).
- HVOCs observed in groundwater at the site are from sources upgradient of the Texaco site.

8.0 REMEDIATION STRATEGY

This investigation demonstrates that the HVOCs (CERCLA wastes) observed in groundwater beneath the site originate from off-site sources and that HVOCs are not present in site soils. We understand that a CERCLA remedial action is being conducted to address HVOC contamination of groundwater in the area, including the groundwater beneath the Texaco Tutu site. A proposed CERCLA remedial technology that addresses HVOCs may also mitigate the VOCs (petroleum hydrocarbons) that originate from the Texaco Tutu site. This possibility was considered during the development of the remediation strategy for the Texaco Tutu site.

This report also concludes that the petroleum hydrocarbon groundwater plume emanating from the Texaco Tutu service station is stable and not migrating further downgradient. Thus, there is no immediate need to remove these petroleum hydrocarbons in groundwater in areas off site. GCL proposes to implement a remedial strategy on site. This remedy can be integrated with whatever remedial strategy is selected for the forthcoming CERCLA action.

GCL proposes soil-vapor extraction technology to remediate hydrocarbon contamination associated with the Texaco Tutu site. The vapor extraction system for the Texaco Tutu site will remove hydrocarbons from the soils of the source area (former UST site) and the groundwater plume center-of-mass. System operation is flexible, and will allow field modifications according to the responses observed during the initial period of operation. These modifications will be made in order to optimize the effectiveness of the system in removing hydrocarbon mass.

8.1 SYSTEM DESIGN PARAMETERS

The ultimate goal of operating a soil-vapor extraction system for the Texaco Tutu site is to remove petroleum hydrocarbons from on-site soils and underlying groundwater. The system presented in this section is designed to remediate hydrocarbon-bearing soils in the vicinity of the former UST pit, and dissolved-phase hydrocarbons in the groundwater underlying the southern portion of the site. Hydrogeological assumptions and conditional parameters taken into consideration for this proposed system include:

- Groundwater flow is generally to the south. The flow is controlled by major fractures in the bedrock and pumpage from area water wells.
- The most transmissive fractures are below the saprolith/bedrock contact, based upon the onset of water production observed during the drilling of the monitoring wells.
- BTEX concentrations are higher in the shallow zone groundwater (30 feet or shallower) than the deeper zone groundwater by more than an order of magnitude.
- Upgradient wells show little impact of BTEX constituents, but contain solvent contamination from an off-site source(s).
- The remedial system must not induce further migration of off-site chlorinated solvents contained in groundwater onto the site.
- The clay-rich soil and interstitial clay in the saprolith may limit the effective radius of influence of the soil-vapor extraction system.

3.2 GENERAL PRINCIPLES OF VAPOR EXTRACTION

Vapor extraction technology refers to the use of forced air ventilation of soil to remove VOCs that vaporize from the soil into the moving air stream. Vapor extraction can be used to treat soil VOCs in situ or ex situ. Successful use of this technology in situ is dependent on having a thorough understanding of site hydrogeology and chemical distribution. For in situ soil-vapor extraction, VOCs are removed under vacuum from recovery wells screened in the vadose zone and monitor wells that span the vadose-groundwater interface, and removed from the soil by releasing the off-gases.

Soil-vapor extraction at the Texaco Tutu site is constrained by the presence of clay-rich soils and underlying saprolith. However, on-site soil contamination is spatially limited. The highest concentration of BTEX constituents in the soils are located in the vicinity of the old UST pit. The pit area was excavated and replaced with gravelly clay. The fill material in this area provides a more porous media for soil venting. Soil venting is considered to be appropriate at this location due to the flexibility of the proposed system. From past GCL experience with other soil-vapor extraction systems applied to sites with similar soil characteristics and contamination, reducing the moisture content in the vadose zone will significantly increase the air permeability. Field studies indicate that as water saturation in the vadose zone drops below 50 percent, the relative air permeability increases. The reduction in soil moisture at this site will gradually increase the air permeability of the clays due to drying and desiccation. The radius of influence for extraction wells will gradually increase over time as the system operates. In addition, with the dual purpose venting wells,

this drying-out process of the clays can be directed to specific areas of impact.

8.3 CONCEPTUAL DESIGN FOR THE TEXACO TUTU SITE

Based upon the results of GCL's field investigation, hydrogeological models performed by other consultants, and other investigations performed at this site, we propose an in situ soil-vapor extraction system for the site. This technology produces a remediation system that will result in rapid, cost-effective cleanup of the Texaco Tutu site.

8.3.1 SPECIFIC DESIGN ELEMENTS

The system will draw soil vapors from the southern portion of the Texaco site, an area that displays the highest concentrations of BTEX constituents at the site. The system will consist of a sub-grade conduit that connects the existing monitor wells TT-1 and TT-4 with the vapor extraction unit (Figure 13). A 3-horsepower vapor extraction unit will provide the pressure gradient and extraction rate necessary for optimal system efficiency. The delivery lateral, constructed with 2-inch schedule 40-PVC, will connect the monitor wells to the vapor extraction unit. The delivery lateral, gauges, and associated sensors will be placed in an 8-inch diameter corrugated aluminum pipe, which will provide protection and permit installation of other piping, if required, for system design flexibility. The corrugated pipe and lateral will be installed in a sub-grade trench running northward from TT-1 to TT-4. The piping will extend eastward from TT-4 to the eastern wall of the site. The piping will be brought above surface from that point and run northward to the northeastern corner of the property and to the extraction unit. The vacuum extraction system will be installed at

this location due to proximity to power lines. The system will also have a water knockout tank to collect water vapor generated by the system.

The monitor wells will be fitted with downhole sensors to prevent water from rising above the screened interval in the wells. When water rises to within one foot of the top of the screen, a bleeder valve will be activated to allow ambient air into the well. The bleeder valves will prevent overheating of the vapor extraction motor and provide a more efficient and reliable system.

Four drive points will be installed at 20-foot intervals between TT-1 and TT-4, and eastward from TT-4 to the eastern property line (Figure 13). The drive points will act either as vapor extraction or air inlet wells for the vadose zone underlying the southern portion of the Texaco Tutu site. The drive points will be constructed of 2 or 4-inch diameter steel casing. They will have five feet of 0.020- to 0.060-inch screens at the lower portion of each point. The drive points will be installed to a depth of between 8 and 10 feet, and will be above the water table.

The drive points will provide multiple functions, and be fitted with three-way valves. The three-way valves will allow these points to act as observation points, vapor extraction wells, or passive venting wells, depending on system needs. Vacuum gauges installed on the points will measure the radius of influence of the vapor extraction wells TT-1 and TT-4. The

drive points will also be connected to the extraction system, with the exception of drive point 4 (which will be used for observation and passive venting only), and will be utilized to extract vapors from shallow site soils. The three-way valves will also allow the drive points to be disconnected from the system. All of the drive points may be utilized as passive venting wells and vacuum observation wells, depending on need. Drive points 1, 2, and 3 may also be used as vapor extraction wells.

Installation of the system will be followed by a start-up/prove-out test to determine the radius of influence of TT-1 and TT-4, evaluate the efficiency and volume of vapors extracted by the system, and ensure the system can be remotely operated. The initial test, which will test extraction well TT-4, is expected to take a minimum of 72 hours. Vapors generated by the system will be closely monitored to ensure compliance with air quality standards for the U.S. Virgin Islands during system operation.

8.3.2 SYSTEM OPERATION

After the initial testing of TT-4, the system will be adjusted for maximum efficiency. Primary extraction wells TT-1 and TT-4 will be used to their full extent to address the contamination located in the soil at these locations. Drive points 2 and 3 will also be used as extraction wells to increase the radius of influence and allow maximum application of the vacuum extraction unit. Drive points 1 and 4 will operate in the passive venting mode to augment the volume of induced air being

pulled through the zone of contamination. If necessary, drive point 1 can also be used as an extraction well, if the air permeability of the soil is less than predicted. The efficiency and radius of influence of the system at a given time can easily be determined by switching the dry wells to the observational mode, allowing the system to equilibrate, and measuring the pressure drop at these points.

8.3.3 MONITORING

The results of the initial test will allow the system network and pneumatics to be ad-

justed, as required. This system will allow area-specific remediation efforts, as deemed necessary. For instance, if vapor monitoring of the drive points indicates that the northeastern portion of the soil plume is mitigated to below field detection limits, drive point 3 will be switched to observational mode, and more vacuum (thus, more vapors) will be extracted from the areas surrounding TT-1 and drive points 1 and 2.

An Operations and Maintenance Plan will be developed after installation has been completed.

9.0 REFERENCES

CDM FPC, February 2, 1990a, letter from Scott Graber to Ms. Caroline Kwan USEPA: Letter Report CLP Sample Analysis Data Summary, Tutu Wellfield area, U.S. Virgin Islands, prepared by CDM FPC for USEPA.

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Geraghty & Miller, May 1993a, Technical Memorandum II, Results of the Field Program, Tutu Service Station Investigation, St. Thomas, U.S. Virgin Islands.

Geraghty & Miller, December 1993b, Draft- Phase II Remedial Investigation Work Plan, Tutu Wells Site, St. Thomas, U.S. Virgin Islands.

GCL, 1993a, November 1, 1993, Technical Opinions Regarding the Texaco Tutu Service Station.

GCL, 1993b, November 9, 1993, Phase I Site Assessment and Interim Remedial Measures Workplan, Tutu Service Station, Tutu, St. Thomas, U.S.V.I.

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Lebron Associates, January 1990, Final Report of Tanks Removal at Texaco Caribbean, Inc.'s Tutu St. Thomas, USVI Service Station, (with) Analysis of Laboratory Results for Soil Sampling Activities, Texaco Service Station, Tutu, St. Thomas, U.S. Virgin Islands.

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Appendix A — Representative Photographs of Field Methods, Geology, and Site Activities at the Texaco Tutu Service Station, December 1993



(1) View of Tutu Service Station site from the southeast, showing traffic, barricades set up with 55-gallon drums at both entrances.



(2) Boring soils at SB-6 with hand auger. Drill rig in background is set up at monitor well TT-2.



(3) Drill rig being used to bore soils at site IG/SB-1.



(4) Taking soil samples of selected intervals through the drill rig using a hand auger. This technique was used for obtaining soil samples from certain soil borings and from monitor wells.



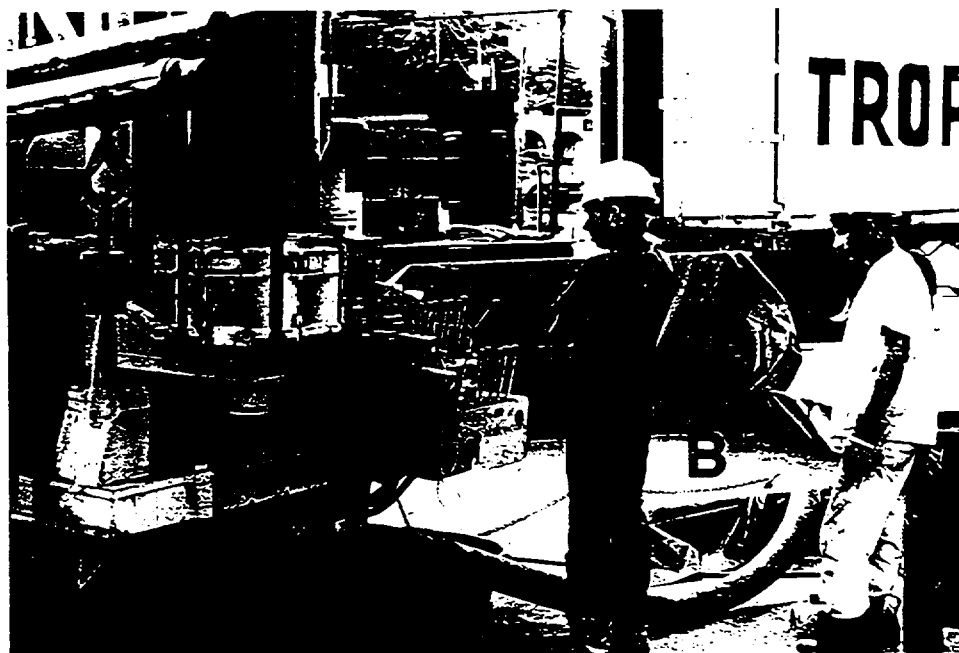
(5) Jackhammering through cement to access soil borings around cleaned-out service bay sumps (arrow).



(6) CP T/650 rig set up and drilling TT-1 cluster well. Drilling at this location required shielding of overhead power lines (arrow).



(7) View, looking west, of drill rig set up over TT-6, in Four Winds Shopping Center parking lot.



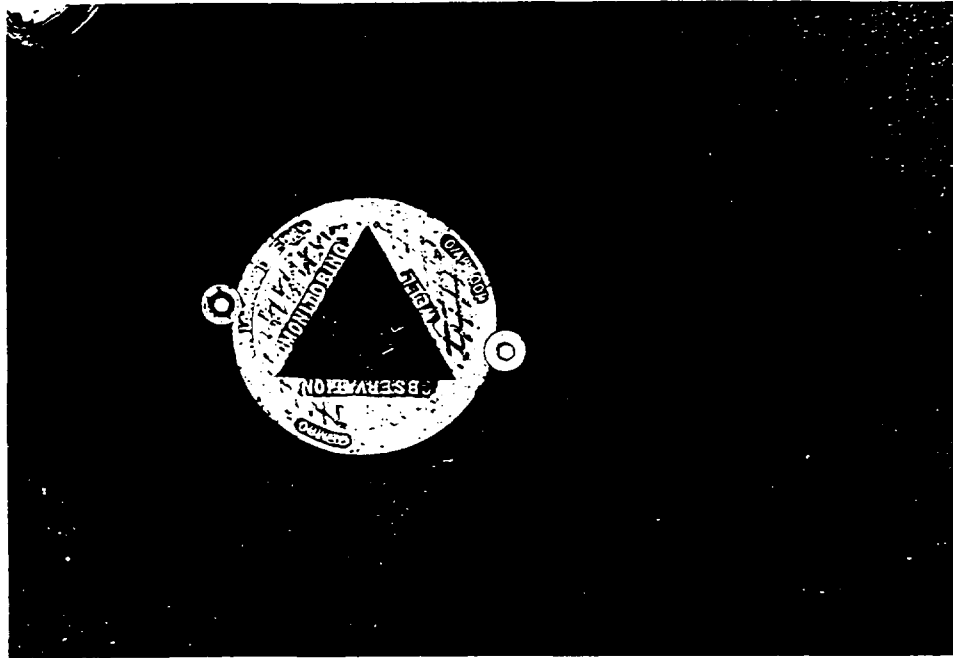
(8) Drill cuttings and fluids were directed from each monitor well bore through a "blooey" line connected to a temporary wellhead (A) and collected in a temporary, lined collection pit (B). Drill waste was then transferred to drums (C).



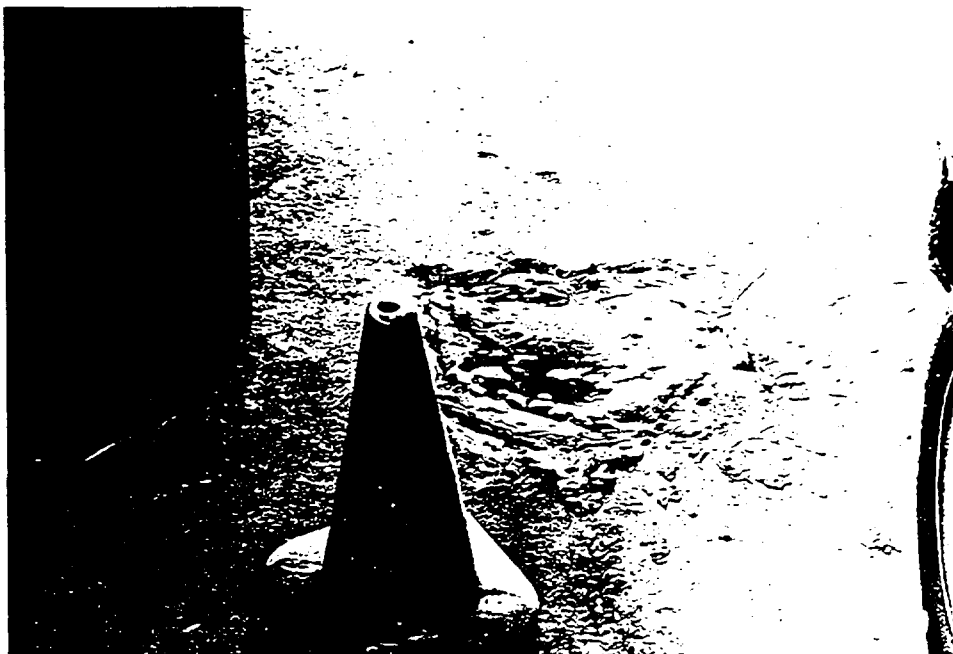
(9) Blank casing (arrow) was set over well screens in each monitor well. The casing was cut off below-grade after grouting.



(10) Injecting neat cement grout into monitor well TT-3d, using motorized mixer (right).



(11) Typical subgrade completion of monitor well at site. An 8-inch steel manhole was cemented into place around the well casing, and a steel cap secured with bolts.



(12) All soil borings were backfilled with native soil and concrete chips, and finished with cement.



(13) Submersible pump (arrow) used to develop 4-inch monitor wells.



(14) Teflon bailers used to develop 2-inch monitor wells, and to obtain water samples from monitor wells and oil/water separator.



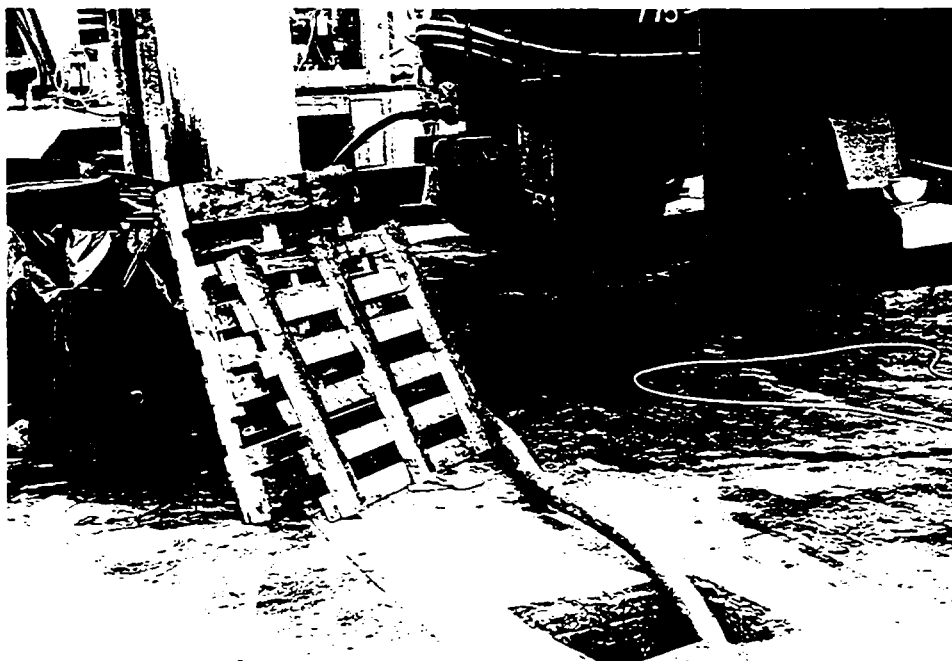
(15) Drill rig set up over temporary decontamination pad.



(16) Decontamination of well casing using portable steam cleaner. Steam cleaner was used to decon all equipment and the rig between each monitor well and boring.



(17) Interior view typical of service bay sumps prior to clean-out and inspection. Oily water and sediment at the base of each sump was shoveled out and sealed in drums. Outlet pipe from each sump lead to oil/water separator, but are all capped.



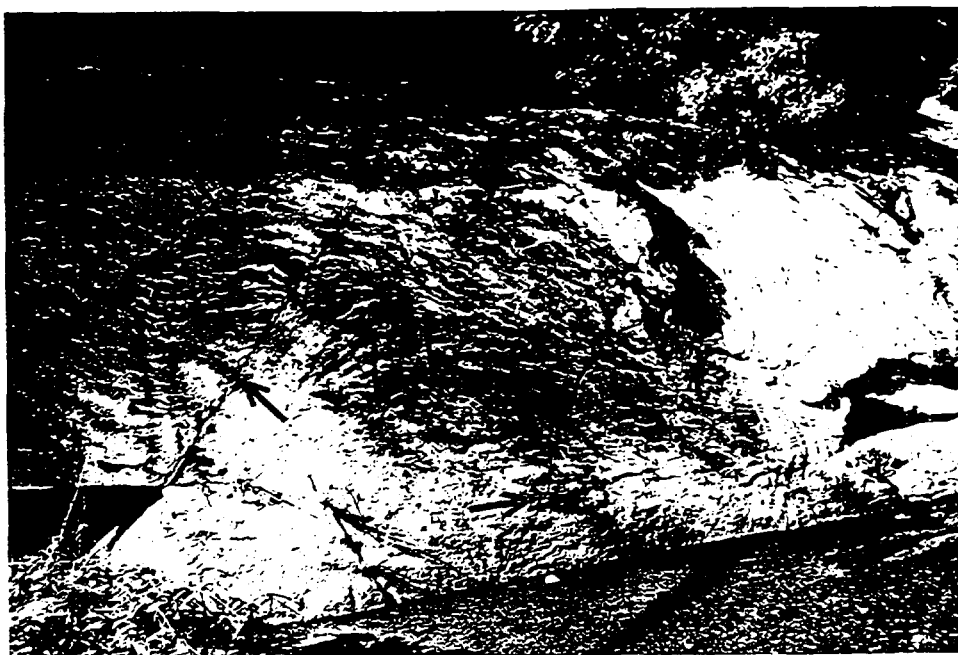
(18) Water being pumped out of septic tank prior to inspection.



(19) Interior view, looking straight down from surface, of infiltration gallery. The upper 5 feet of the gallery is walled with cinder block and concrete (A), the bottom 5 feet by cemented native boulders (B), and the base of the gallery is floored by moist sand (C) at 10 feet below the surface.



(20) Interior view of water filling the oil/water separator prior to clean-out and inspection. Heavy rubber sheath covers the outlet drain (arrow).



(21) Andesite breccia bedrock exposed behind Pueblo Foods. Note dominant fracture set (arrows).



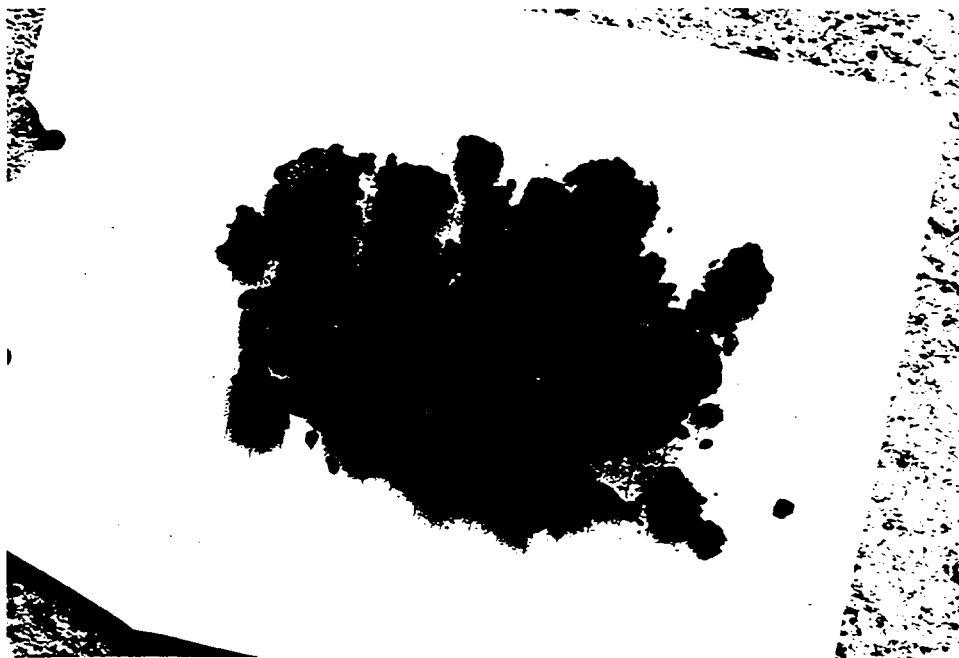
(22) Weathered bedrock (saprolite) exposed north of site at Gomez School. Weathered andesite boulders (A) are mixed with moderately plastic, interstitial clay (B).



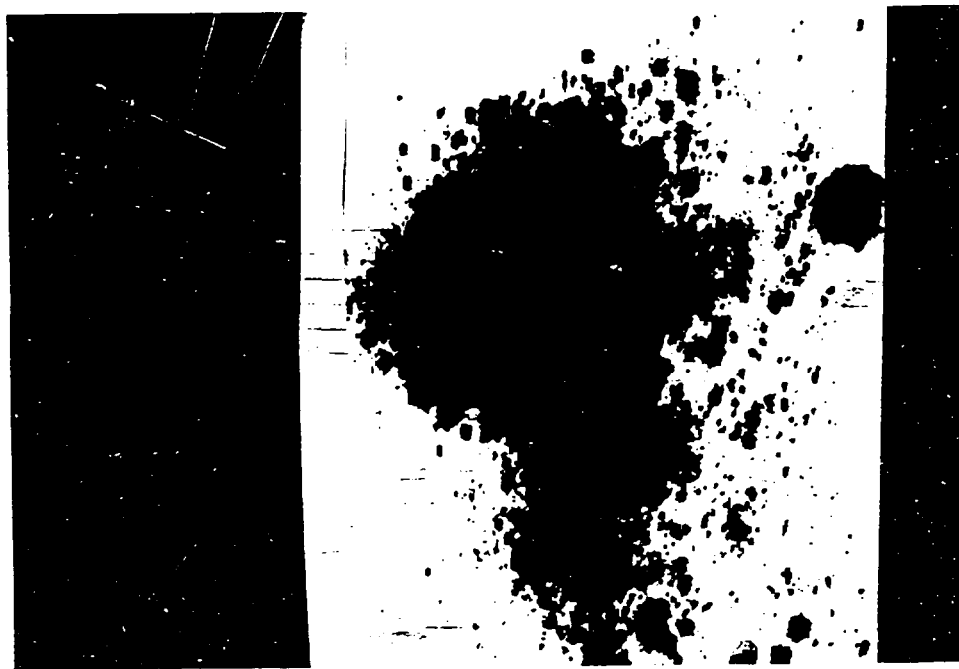
(23) View looking east from north end of Four Winds parking lot, at Ramsey Motors (A), Antilles Service (B), Texaco Tutu Service Station (C), and ridge that defines fault block south of Texaco site (D).



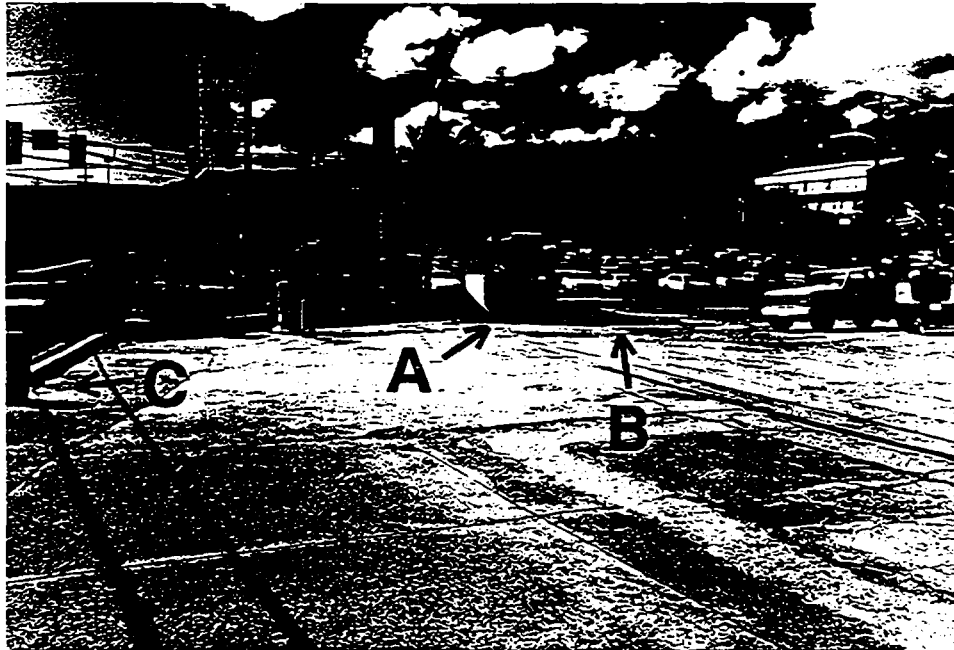
(24) Typical non-impacted clayey soil from under Texaco site (SB-1).



(25) Staining from heavy oil in soils from 6.5 feet in OW/SB-1.



(26) Stained soils from 6.0 feet in TT-4 well bore, located in the center of the former UST pit site.



(27) West view across Texaco site after completion of Phase I activities, showing waste water storage tanks (A), temporary decon pad (B), and TT-1 well cluster (C).



(28) Drums filled with monitor well wastes stored alongside existing waste oil drums on east side of site.

Appendix B — Work Plan Addendum



Marquette NW, Ste. 1100 • Albuquerque, NM 87102
(505) 842-0001 • FAX: (505) 842-0595

December 2, 1993

VIA TELEFAX

Mr. Adrian Schottroff
DPNR
Water Gut Homes-1118
Christiansted, St. Croix
U.S.V.I. 00820-5065

RE: ADDENDUM NO. 1 TO PHASE 1 SITE ASSESSMENT AND INTERIM
REMEDIAL MEASURES WORK PLAN, TUTU TEXACO STATION ST.
THOMAS, U.S.V.I., NOVEMBER 8, 1993

Dear Mr. Schottroff:

Texaco has elected to obtain a soil sample north of SB-4 and adjacent to the property fence. The boring will be advanced by hand auger and the sample will be collected at approximately 5-foot depth or at auger refusal. All work will be implemented in accordance with the work plan. This sampling event will probably occur next week.

Sincerely,
H+GCL

Randall T. Hicks, CPG
Vice President

54173/SCHOTT.LTR

December 9, 1993

VIA TELEFAX

Mr. Clifford Crooke
Environmental Specialist
Department of Planning and Natural Resources
Division of Environmental Protection
Suite 231
Nisky Center
St. Thomas, U.S.V.I. 00802

RE: ADDENDUM NO. 2 TO PHASE 1 SITE ASSESSMENT AND INTERIM
REMEDIAL MEASURES WORK PLAN, TUTU TEXACO STATION ST.
THOMAS, U.S.V.I., NOVEMBER 8, 1993

Dear Mr. Crooke:

H+GCL plans to drill a shallow monitor well to clearly delineate the down gradient extent of petroleum hydrocarbon contamination near the Texaco Tutu Service Station. The estimated extent of petroleum hydrocarbon contamination is shown on the attached map; isoconcentration lines of total BTEX are in units of ppb. The proposed well, TT-6, is located in the Four Winds Shopping Center parking lot, east of the storm sewer, south of MW-6r and west of MW-7.

We have discussed the need for this well and the well location with Adrian Schottroff of your staff. We have obtained permission from Four Winds Shopping Center to install the well on their site. Mr. Lou Mazzullo of H+GCL, our on-site coordinator, should have filed a well permit. The exact location of this well will be selected in the field by Mr. Mazzullo after a utilities survey of the proposed location.

Mr. Clifford Crooke
Page 2
December 9, 1993

If you should have any questions concerning this well installation, please contact Lou Mazzullo at the Texaco Tutu Service Station site. As discussed with Mr. Schottroff, we plan to drill this well Friday, December 10.

Sincerely,
H*GCL



Randall T. Hicks, CPG
Vice President

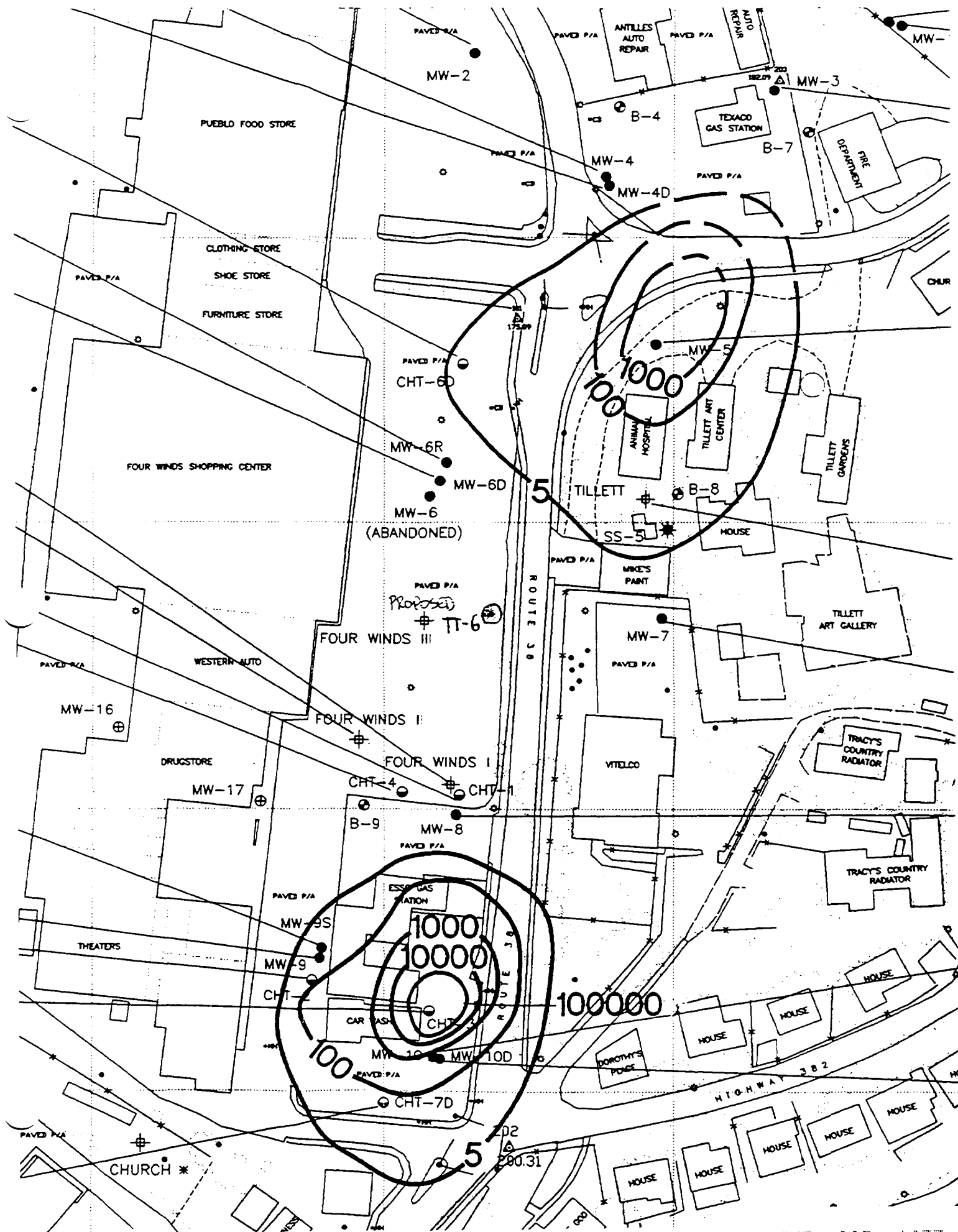
RTH/pip/54173/CROOK001.LTR

Enclosure

cc:

Adrian Schottroff, DPNR
Ivan A. Cooper, P.E. - Cooper Environmental, Ramsay Motors, Inc.
Donald P. Galya, P.E. - ENSR Consulting and Engineering, Western Auto, Inc.
Bruce K. Green - Caribbean Hydro-Tech, Inc., Four Winds Plaza Partnership
Randall T. Hicks - H*GCL, Inc., Texaco Caribbean Inc.
David E. Langseth - Arthur D. Little, Inc., Laga
Kenneth L. Loy - International Technology Corporation, L'Henri, Inc.
Thomas F. Maguire, CPG - Blasland & Bouck Engineers, P.C., Esso, S.A.
Paul Ryan, Texaco







GOVERNMENT OF THE VIRGIN ISLANDS OF THE UNITED STATES

DEPARTMENT OF PLANNING AND NATURAL RESOURCES

NISKY SHOPPING CENTER

SUITE 45

CHARLOTTE AMALIE, ST. THOMAS, V.I. 00802

APPLICATION FOR PERMIT TO DRILL WELL

DATE December 10, 1993

TO: Department of Planning and Natural Resources
Division of Environmental Protection
Nisky Shopping Center, Suite 45
Charlotte Amalie, VI 00802

In compliance with Title 12, Chapter 5, Virgin Islands Code, the undersigned

Caribbean Hydro-Tech, Inc.

Name of Driller

P.O. Box 2070 Kingshill, St. Croix, U.S. V.I. 00802

Mailing Address

(809) 778-6551

Telephone Number

hereby applies for a permit to:

 x Drill a well

 Deepen an existing well

 Clean and refurbish an existing well

on the property:

Four Winds Shopping Center

(Name of Property Owner)

Anna's Retreat, 392, St. Thomas

(Estate, Lot Number and Island)

1-0-5604-0105-00

(Property Tax Number)

Well Drilling Permit Application

Page 2

The well will be drilled to the approximate depth of 35 feet and will be 4 inches in diameter. It will have 15 feet of casing, constructed of PVC material, 20 feet of screening of 0.02 Slot PVC (description of screen) and will have neat cement w/5% bentonite (proposed type of casing seal).

Purpose of well: Monitoring of groundwater

The attached sketch (property map from Cadastral Survey) shows location of proposed well relative to existing buildings or other physical features, the location of existing wells on the property or nearby adjacent properties, and the location of all known sources of contamination in the vicinity.

If pump will be installed by driller, answer the following:

Capacity of Pump Horsepower Size
(GPM) (HP) (Inches)

A log showing the various strata or formations intersected by the well, formation yields and quality, and casing and screening details will be forwarded to the Division of Environmental Protection within 30 days after completion of drilling operations.

Fee of \$10.00 is attached. (If check, please make payable to the Government of the Virgin Islands)

[Signature] H. Hall (See attachment)
Signature of Property Owner

Permit No.

[Signature]
Signature of Well Driller

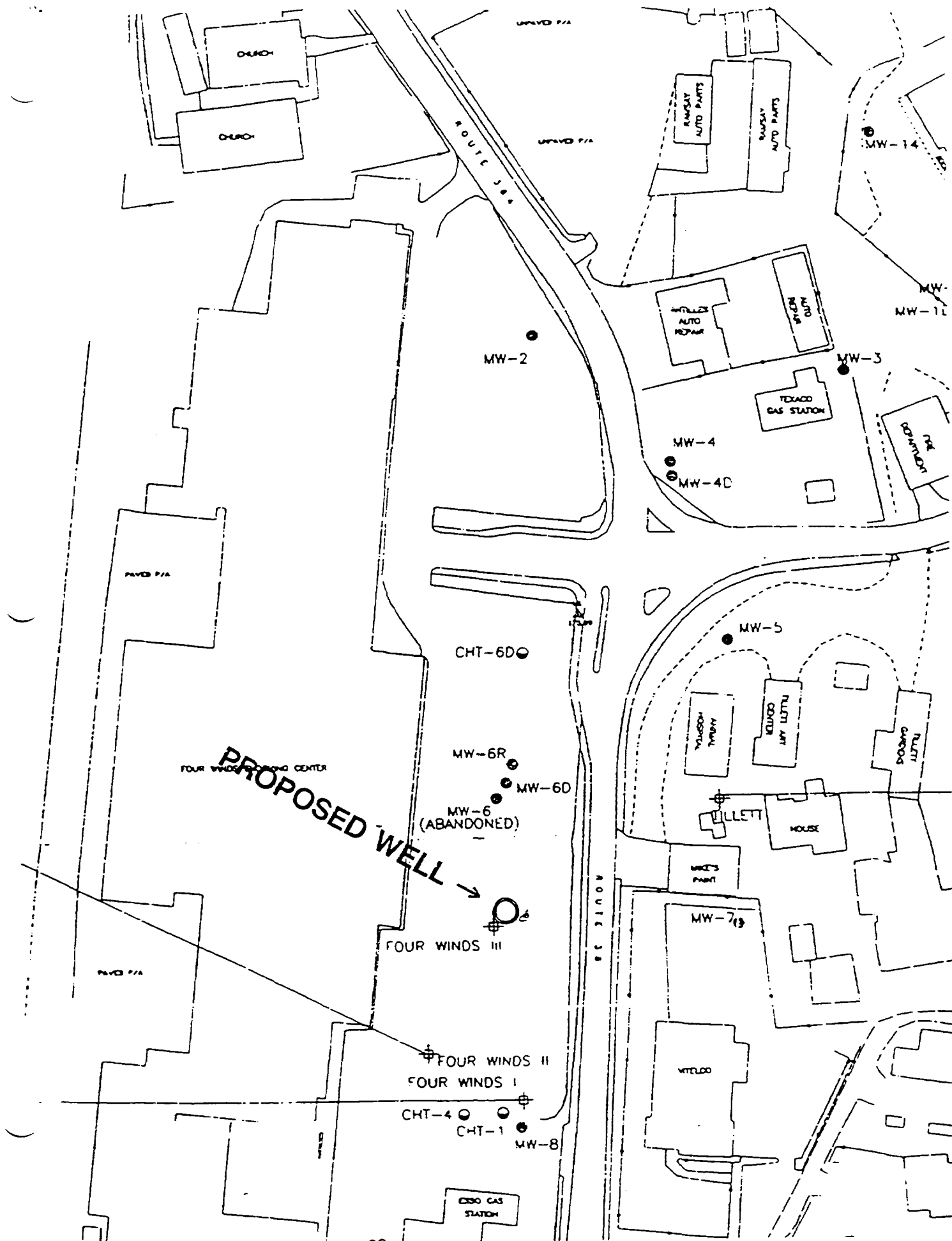
License No. WDL-012-90

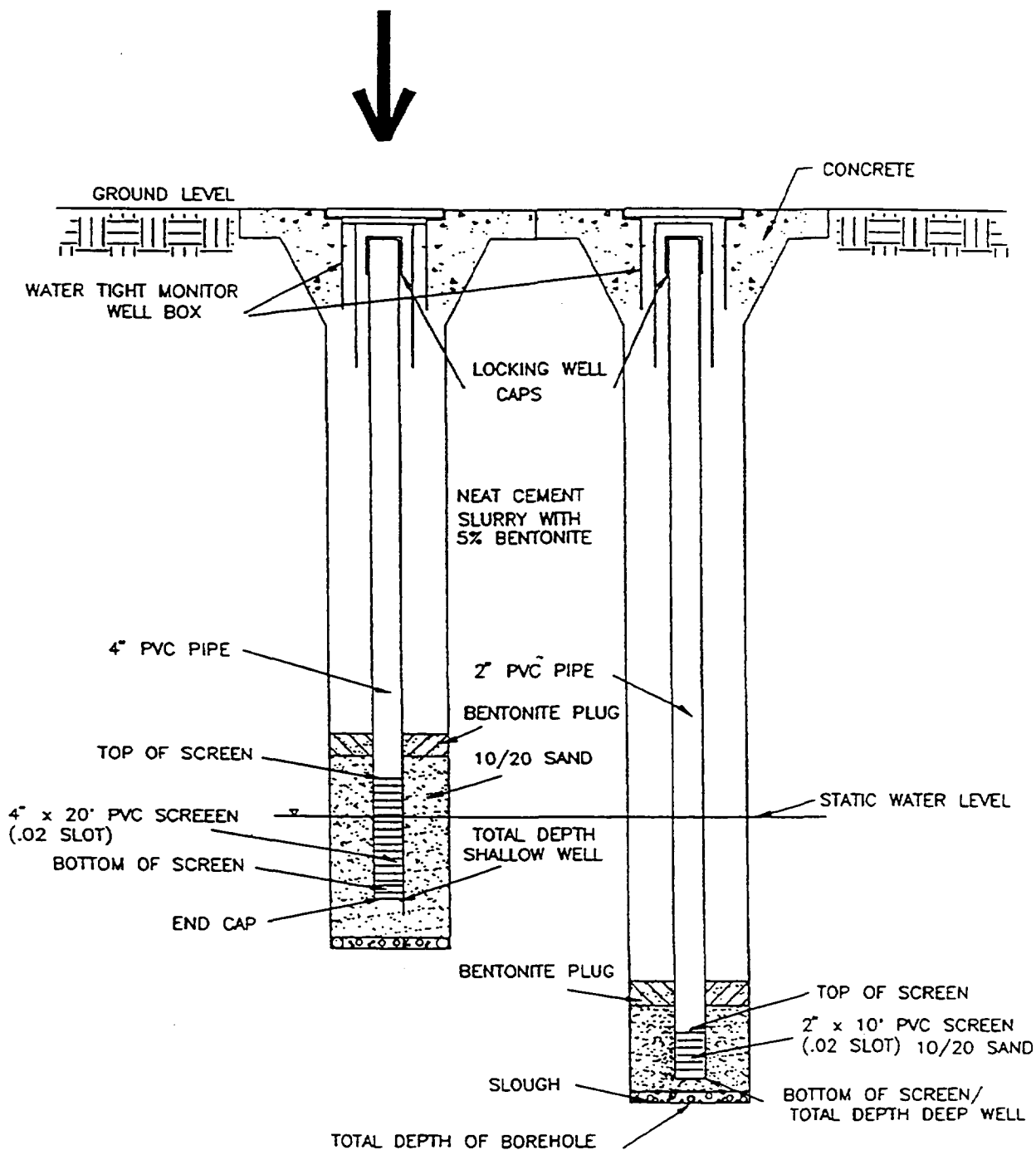
DATE: Dec 10/93 APPROVED: ✓ DISAPPROVED:

REMARKS and/or SPECIAL CONDITIONS:

Well for ground water quality sampling / monitoring only.
Not for water use for human consumption.

SIGNATURE OF WELL INSPECTOR: [Signature]





CLIENT: O'CONNER & LEMOS	
DATE: 11-5-93	REV. NO.: 1
AUTHOR: BKL	DRAWN BY: HCC
CK'D BY: RTH	FILE: DUALWL.DWG

FIGURE 5
WELL COMPLETION
DIAGRAMS

DEC 9 93 15:38

Timothy R. Knutson
Senior Attorney

Texaco Inc

2000 Westchester Avenue
White Plains NY 10650
Phone 914 253 4633
Fax 914 253 4629

December 9, 1993

VIA TELEFAXJohn K. Dema, Esq.
1236 Strand Street, Suite 103
Christiansted, St. Croix, USVI

Dear Jack:

Per your discussion earlier today with Steve Kirkland, you are aware that Texaco would like to drill a monitoring well on the Four Winds Plaza parking lot tomorrow. The DPNR has requested that we obtain a written indication of approval from Four Winds to perform such work before it can be initiated. Therefore, would you please either sign below on behalf of Four Winds or obtain a signature from an authorized party from Four Winds?

Thanks for your help.

Sincerely,

Timothy R. Knutson

Approval is hereby granted for Texaco Caribbean Inc. or its authorized representative to drill a monitoring well in the parking lot of the Four Winds Plaza.

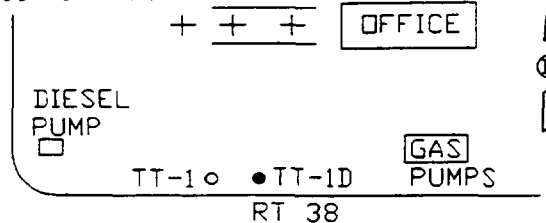
_____ for the Four Winds Plaza Partnership

Appendix C — Lithologic Logs of Monitor Well Borings Drilled In December 1993, Texaco Tutu Investigation

LITHOLOGIC LOG (CUTTINGS)

Page 1 of 1

LOCATION MAP:



SITE ID: TEXACO TUTU LOCATION ID: TT-1
 SITE COORDINATES (ft.):
 N _____ E _____
 GROUND ELEVATION (ft. MSL): _____
 STATE: ST. THOMAS COUNTY: U.S.V.I.
 DRILLING METHOD: AIR ROTARY/HAMMER
 DRILLING CONTR.: CARRIBEAN HYDRO-TECH
 DATE STARTED: 12/8/93 DATE COMPLETED: 12/8/93
 FIELD REP.: MAZZULLO/MONTANO
 COMMENTS: _____

____ 1/4 ____ 1/4 ____ 1/4 ____ 1/4 S ____ T ____ R ____

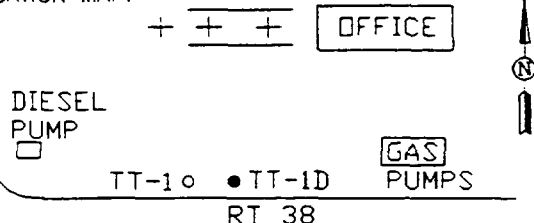
LOCATION DESCRIPTION: SOUTH END OF STATION ALONG CURB, 5 FT. WEST OF TT-1D

DEPTH H	WELL CONST.	LITH.	VISUAL %	SAMPLE		LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
				TYPE	INTERVAL	
5	4" PVC BLANK			PID	5 ppm	0.0-0.5 CEMENT
				HEAD-SPACE	94 ppm	0.5-5.0 CLAY = MODERATE GREENISH-GRAY (5B 5/1), MODERATE PLASTICITY, SANDY TO PEBBLY (20-25%), WITH MILD WASTE OIL ODOR.
				HEAD-SPACE	48 ppm	5.0-7.5 CLAY = OLIVE-GRAY (5Y 4/1), MODERATE PLASTICITY, SANDY (10-15%) WITH SOME LARGER ROCKS AND TREE ROOTS.
10				HEAD-SPACE	19 ppm	7.5-15.0 PEBBLY CLAY = GRAY-GREEN (5G 4/1), MODERATE PLASTICITY, 15-20% PEBBLES (LOCALLY HIGHER PROPORTION).
15				PID	7 ppm	15.0-21.0 WEATHERED BEDROCK = DARK GREENISH-GRAY (5G 4/1), ALTERED ANDESITE AND BASALT BRECCIA, WITH INTERSTITIAL CLAY.
20	4" .010 SLOTTED PVC			PID	16 ppm	21.0-36.3 VOLCANIC BRECCIA = FRACTURED, BLACK (5G 2/1), BASALT BRECCIA, DOWN TO FRACTURED, DARK GREENISH-GRAY (5G 4/1), AUGITE-ANDESITE BRECCIA. SLIGHT GASOLINE ODOR TOWARDS BOTTOM.
25				PID	121 ppm	
30				PID	24 ppm	TD = 36.3 FT. B/SCREEN = 30 FT. INITIAL WATER LEVEL = 12.45 FT. BGL
35				PID	6 ppm	
				PID	5 ppm	
40						
45						
50						

LITHOLOGIC LOG (CUTTINGS)

Page 1 of 1

LOCATION MAP:



SITE ID: TEXACO TUTU LOCATION ID: TT-1D
 SITE COORDINATES (ft.):
 N _____ E _____
 GROUND ELEVATION (ft. MSL): _____
 STATE: ST. THOMAS COUNTY: U.S.V.I.
 DRILLING METHOD: AIR ROTARY/HAMMER
 DRILLING CONTR.: CARIBBEAN HYDRO-TECH
 DATE STARTED: 12/7/93 DATE COMPLETED: 12/7/93
 FIELD REP.: MAZZULLO/MONTANO
 COMMENTS: 5 FOOT SCREEN INSTALLED DUE TO HIGH WATER PRODUCTION

LOCATION DESCRIPTION: SOUTH END OF SERVICE STATION ALONG CURB, 5 FT. EAST OF TT-1

DEPTH	WELL CONST.	LITH.	VISUAL %	SAMPLE		LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
				TYPE	INTERVAL	
2'	PVC					0.0-0.5 CEMENT
5'	BLANK					0.5-5.0 CLAY = DARK GREEN-GRAY (SGY 4/1), MODERATLY PLASTIC, SANDY (10-20%), STAINED WITH HEAVY OIL.
				HEAD-SPACE	297 ppm	5.0-7.5 CLAY = DARK OLIVE-GREEN/GRAY (SY 4/1), MODERATLY PLASTIC, PEBBLY (UP TO 2' PEBBLES 10-20%), HEAVY OIL STAINED.
	10'x2' PVC			HEAD-SPACE	153 ppm	7.5-16.5 PEBBLY CLAY = DARK GREEN-GRAY (SG 4/1), PEBBLES TO SMALL COBBLES, TURNING MOIST AT 12 FT. (NOTE HAMMER BIT USED TO DRILL OUT BELOW 10 FT).
				HEAD-SPACE	41 ppm	
				PID	0.5 ppm	
15'						16.5-25.0 WEATHERED BEDROCK = DARK GREENISH-GRAY (SG 4/1), ALTERED ANDESITE TO BASALT BRECCIA, WITH GREEN-GRAY INTERSTITIAL CLAY.
20'	10'x2' PVC					
25'						25.0-50.0 VOLCANIC BRECCIA = DARK GREENISH GRAY (SG 4/1) AUGITE-ANDESITE BRECCIA AND LOCALLY, BLACK (SG 2/1) BASALT BRECCIA. LARGE OPEN FRACTURES AND PROLIFIC WATER PRODUCTION BELOW 35 FT. GASOLINE ODOR AT TOP OF FRACTURE ZONE.
30'	10'x2' PVC			PID	2.9 ppm	
35'				PID	166 ppm	
				PID	325 ppm	
				PID	182 ppm	
40'	10'x2' PVC					
45'						
50'	2'x0.020 PVC			PID	6 ppm	

TD = 53.0 FT.
 B/SCREEN = 50.3 FT.
 INITIAL WATER LEVEL = 12.92 FT. BGL

LITHOLOGIC LOG (CUTTINGS)

Page 1 of 1

LOCATION MAP: WALL

• TT-2

+

+

+

OFFICE

PUMPS

ROAD

1/4 1/4 1/4 1/4 S T R

SITE ID: TEXACO TUTU LOCATION ID: TT-2

SITE COORDINATES (ft.):

N _____ E _____

GROUND ELEVATION (ft. MSL): _____

STATE: ST. THOMAS COUNTY: U.S.V.I.

DRILLING METHOD: AIR ROTARY/HAMMER

DRILLING CONTR.: CARIBBEAN HYDRO-TECH

DATE STARTED: 12/4/93 DATE COMPLETED: 12/6/93

FIELD REP.: MAZZULLO/MONTANO

COMMENTS: _____

LOCATION DESCRIPTION: NORTHWEST SIDE OF SERVICE STATION (OPPOSITE ANTILLES AUTO)

DEPTH H	WELL CONST.	LITH.	VISUAL %	SAMPLE		LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
				TYPE	INTERVAL	
0	4' PVC BLANK			PID	0 ppm	0.0-0.5 CEMENT
5				HEAD-SPACE	42 ppm	0.5-2.5 CLAY = REDDISH-BROWN (10YR 3/4), GRAVELLY TO SANDY (UP TO 40 %), MOIST.
10				PID	0 ppm	2.5-5.0 CLAY = DARK REDDISH-BROWN (10R 3/4), MODERATE PLASTICITY, SANDY TO PEBBLY (<5%), MOIST.
15						5.0-9.5 WEATHERED BEDROCK = DARK GREENISH-GRAY (5G 4/1) ANDESITE BRECCIA, WITH DARK GREEN-GRAY INTERSTITIAL CLAY.
20				PID	0 ppm	9.5-10.0 CLAY = GRAYISH-GREEN (5G 4/1) BEDROCK-DERIVED CLAY, WITH LARGE PEBBLES OF WEATHERED BEDROCK.
25	.010-SLOT PVC					10.0-17.0 WEATHERED BEDROCK = AS IN 5.0-9.5.
30						17.0-37.0 VOLCANIC BRECCIA = BLACK (5G 2/1) BASALT BRECCIA, GRADING DOWN TO DARK GREEN-GRAY (5G 4/1), FRACTURED, AUGITE-ANDESITE BRECCIA.
35						
40						
45						
50						

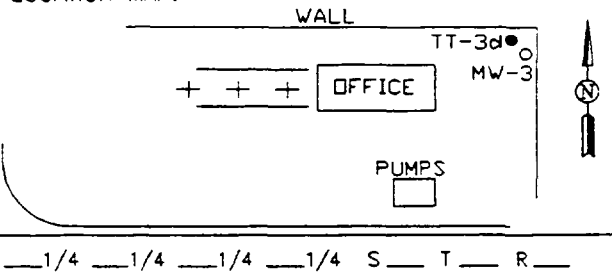
TD = 37.0 FT.
B/SCREEN = 29.0 FT.
INITIAL WATER LEVEL = 11.62 FT.

* NOTE : HEADSPACE READINGS VARIABLE DUE TO HIGH MOISTURE CONTENT.

LITHOLOGIC LOG (CUTTINGS)

Page 1 of 1

LOCATION MAP:



SITE ID: TEXACO TUTU LOCATION ID: TT-3D
 SITE COORDINATES (ft.):
 N _____ E _____
 GROUND ELEVATION (ft. MSL): _____
 STATE: ST. THOMAS COUNTY: U.S.V.I.
 DRILLING METHOD: AIR ROTARY/HAMMER
 DRILLING CONTR.: CARIBBEAN HYDRO-TECH
 DATE STARTED: 11/30/93 DATE COMPLETED: 12/6/93
 FIELD REP.: MAZZULLO/MONTANO
 COMMENTS: COMPLETION DELAYED WAITING ON
REPLACEMENT OF AIR HAMMER PART

LOCATION DESCRIPTION: NORTHEAST CORNER OF SERVICE STATION

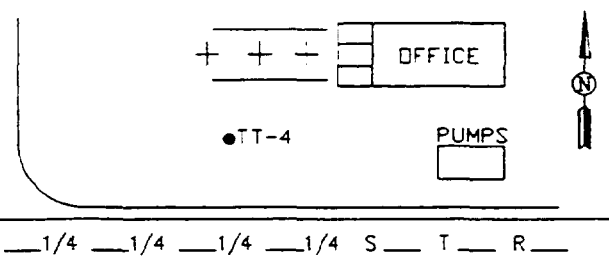
DEPTH	WELL CONST.	LITH.	VISUAL %	SAMPLE		LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
				TYPE	INTERVAL	
0						0.0-0.5 CEMENT
5	2" PVC BLANK					0.5-2.5 GRAVEL FILL
10				PID	0 ppm	2.5-11.0 WEATHERED BEDROCK = DARK GREENISH-GRAY (SG 4/1) ALTERED ANDESITE BRECCIA, WITH DARK GREEN-GRAY INTERSTITIAL CLAY.
15	20 FT x 2" PVC BLANK			PID	0 ppm	
20				PID	0 ppm	
25				PID	0 ppm	11.0-55.0 VOLCANIC BRECCIA = DARK GREENISH-GRAY (SG 4/1) AUGITE-ANDESITE BRECCIA, WITH HEALED FRACTURES DOWN TO ABOUT 35.0 FT.
30	20 FT x 2" PVC BLANK			PID	0 ppm	
35				PID	0 ppm	
40				PID	0 ppm	
45	.020-SLOT PVC			PID	0 ppm	
50						

TD = 55 FT.
 B/SCREEN = 53 FT.
 INITIAL WATER LEVEL = 12.6 FT.

LITHOLOGIC LOG (CUTTINGS)

Page 1 of 1

LOCATION MAP:



SITE ID: TEXACO TUTU LOCATION ID: TT-4
 SITE COORDINATES (ft.):
 N _____ E _____
 GROUND ELEVATION (ft. MSL): _____
 STATE: ST. THOMAS COUNTY: U.S.V.I.
 DRILLING METHOD: AIR ROTARY/HAMMER
 DRILLING CONTR.: CARRIBBEAN HYDRO-TECH
 DATE STARTED: 12/2/93 DATE COMPLETED: 12/3/93
 FIELD REP.: MAZZULLO/MONTANO
 COMMENTS: _____

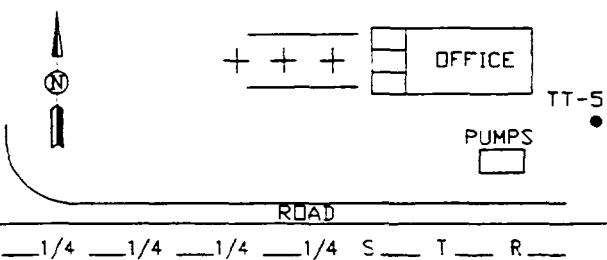
LOCATION DESCRIPTION: CENTER OF UST PIT AREA

DEPTH	WELL CONST.	LITH.	VISUAL %	SAMPLE		LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
				TYPE	INTERVAL	
0.0-0.5	4" PVC BLANK			HEAD-SPACE	8.3 ppm	CONCRETE
0.5-9.0				PID	30.0 ppm	CLAYEY FILL = DARK GRAY TO GREENISH-GRAY (SG 4/1), GRAVELLY (UP TO 40%), MODERATELY PLASTIC CLAY, WITH LOCALLY MODERATE HEAVY-OIL ODOR.
				HEAD-SPACE	22.0 ppm	
				PID	16.0 ppm	
9.0-16.5	4" .020-SLOT PVC					WEATHERED BEDROCK = DARK GREENISH-GRAY (SG 4/1) ANDESITE BRECCIA, WITH DARK GREENISH-GRAY CLAY FILLING INTERSTICES.
16.5-36.0						VOLCANIC BRECCIA = DARK GREENISH-GRAY (SG 4/1) AUGITE-ANDESITE BRECCIA, WITH SPORADIC DIKES OR INCLUSIONS OF BLACK (SG 2/1) BASALT BRECCIA. FRACTURES NOTEABLE NEAR 26-27 FT. AND SOFT WEATHERED ZONE NEAR 33 FT.
TD = 36.0 FT.						
B/SCREEN = 28.5 FT.						
INITIAL WATER LEVEL = 13.73 FT. BGL						

LITHOLOGIC LOG (CUTTINGS)

Page 1 of 1

LOCATION MAP:



SITE ID: TEXACO TUTU LOCATION ID: TT-5
 SITE COORDINATES (ft.):
 N _____ E _____
 GROUND ELEVATION (ft. MSL): _____
 STATE: ST. THOMAS COUNTY: U.S.V.I.
 DRILLING METHOD: AIR ROTARY/HAMMER
 DRILLING CONTR.: CARIBBEAN HYDRO-TECH
 DATE STARTED: 12/3/93 DATE COMPLETED: 12/3/93
 FIELD REP.: MAZZULLO/MONTANO
 COMMENTS: _____

LOCATION DESCRIPTION: EAST SIDE OF SERVICE STATION, NEAR AIR PUMP

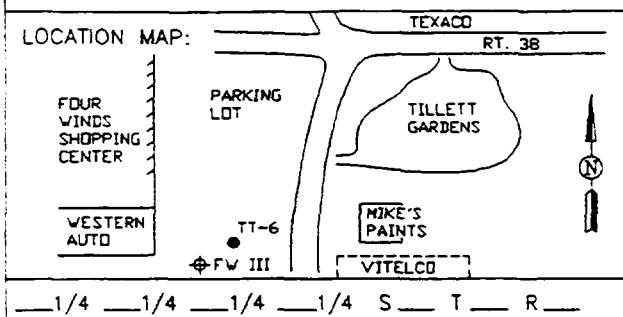
DEPTH	WELL CONST.	LITH.	VISUAL %	SAMPLE		LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
				TYPE	INTERVAL	
0	4" PVC BLANK			PID	0 ppm	0.0-0.5 CONCRETE
5				HEAD-SPACE	22 ppm*	0.5-2.5 SANDY CLAY = DARK GREENISH-GRAY (SG 4/1), MODERATELY PLASTIC, SLIGHTLY SANDY (<10%).
10				HEAD-SPACE	37 ppm*	2.5-4.5 SANDY CLAY = DARK GREEN-GRAY (SG 4/1), HIGH PLASTICITY, VERY MOIST, WITH SOME PEBBLES AND LESS THAN 10% SAND.
15				HEAD-SPACE	1 ppm	4.5-6.0 CLAY = MODERATELY REDDISH-BROWN (10R 4/6), HIGH PLASTICITY, MOIST.
20	4" .020 SLOTTED PVC					6.0-7.5 SANDY CLAY = DARK GREENISH-GRAY (SG 4/1), MODERATE PLASTICITY, VERY SANDY (40%), SLIGHTLY MOIST.
25						7.5-27.5 WEATHERED BEDROCK = GREEN (SGY 4/1), CLAY-RICH, WEATHERED ANDESITE BRECCIA.
30						
35						
40						27.5-38.0 VOLCANIC BRECCIA = DARK GREENISH-GRAY (SG 4/1) TO OLIVE BLACK (SY 2/1), FRACTURED, AUGITE-ANDESITE BRECCIA.
45						
50						
55						

TD = 38.0 FT.
 B/SCREEN = 30.0 FT.
 INITIAL WATER LEVEL = 15.5 FT. BGL.

* HEADSPACE READINGS VARIABLE DUE TO HIGH MOISTURE CONTENT.

LITHOLOGIC LOG (CUTTINGS)

Page 1 of 1



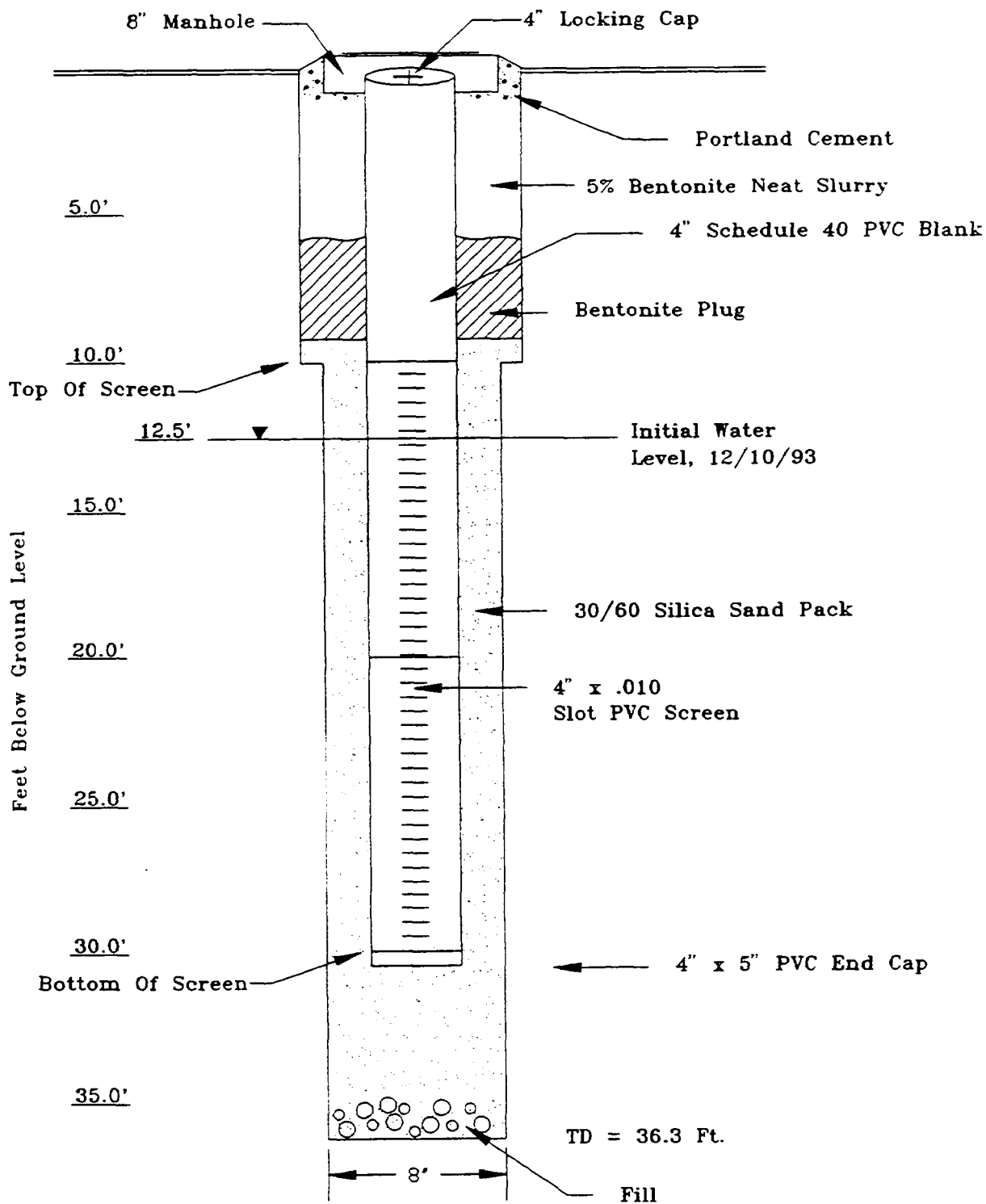
SITE ID: TEXACO TUTU LOCATION ID: TT-6
 SITE COORDINATES (ft.):
 N _____ E _____
 GROUND ELEVATION (ft. MSL): _____
 STATE: ST. THOMAS COUNTY: U.S.V.I.
 DRILLING METHOD: AIR ROTARY/HAMMER
 DRILLING CONTR.: CARIBBEAN HYDRO-TECH
 DATE STARTED: 12/10/93 DATE COMPLETED: 12/11/93
 FIELD REP.: MAZZULLO
 COMMENTS: UNSTABLE HOLE CONDITIONS PRECLUDED
PLACEMENT OF 20 FT. SCREEN

LOCATION DESCRIPTION: IN FOUR WINDS PARKING LOT 30 FT. NORTHEAST OF FOUR WINDS III WELL

DEPTH	WELL CONST.	LITH.	VISUAL %	SAMPLE		LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
				TYPE	INTERVAL	
0.0-0.5	4" PVC BLANK					ASPHALT
0.5-1.5						CLAY = BROWN (SYR 4/4), MODERATELY PLASTIC. NO STAIN OR ODOR.
1.5-27.0	4" .010-SLOT PVC					WEATHERED BEDROCK = GREENISH-GRAY (SG 4/1) TO OLIVE-GRAY (SY 4/1), EXTREMELY WEATHERED ANDESITE BRECCIA, WITH COBBLE TO BOULDERS IN WEATHERED CLAY MATRIX. VERY FAST DRILLING.
27.0-33.0				PID	0.2 ppm	VOLCANIC BRECCIA = GREENISH-GRAY (SG 4/1) FRACTURED, AUGITE-ANDESITE TO BASALTIC BRECCIA.
				PID	0 ppm	
				PID	0 ppm	
TD = 33.0 FT.						
B/SCREEN = 13.5 FT.						
INITIAL WATER LEVEL = 6.0 FT. BGL.						
* NOTE : SEVERE CAVING FROM WEATHERED ZONE FILLED HOLE UP TO 15 FT. BGL.						

Appendix D — Well Completion Diagrams, Texaco Tutu Investigation, December 1993





CLIENT: TEXACO-TUTU

DATE: 12-30-93

REV. NO.:

AUTHOR: L.J.M.

DRAWN BY: HCC

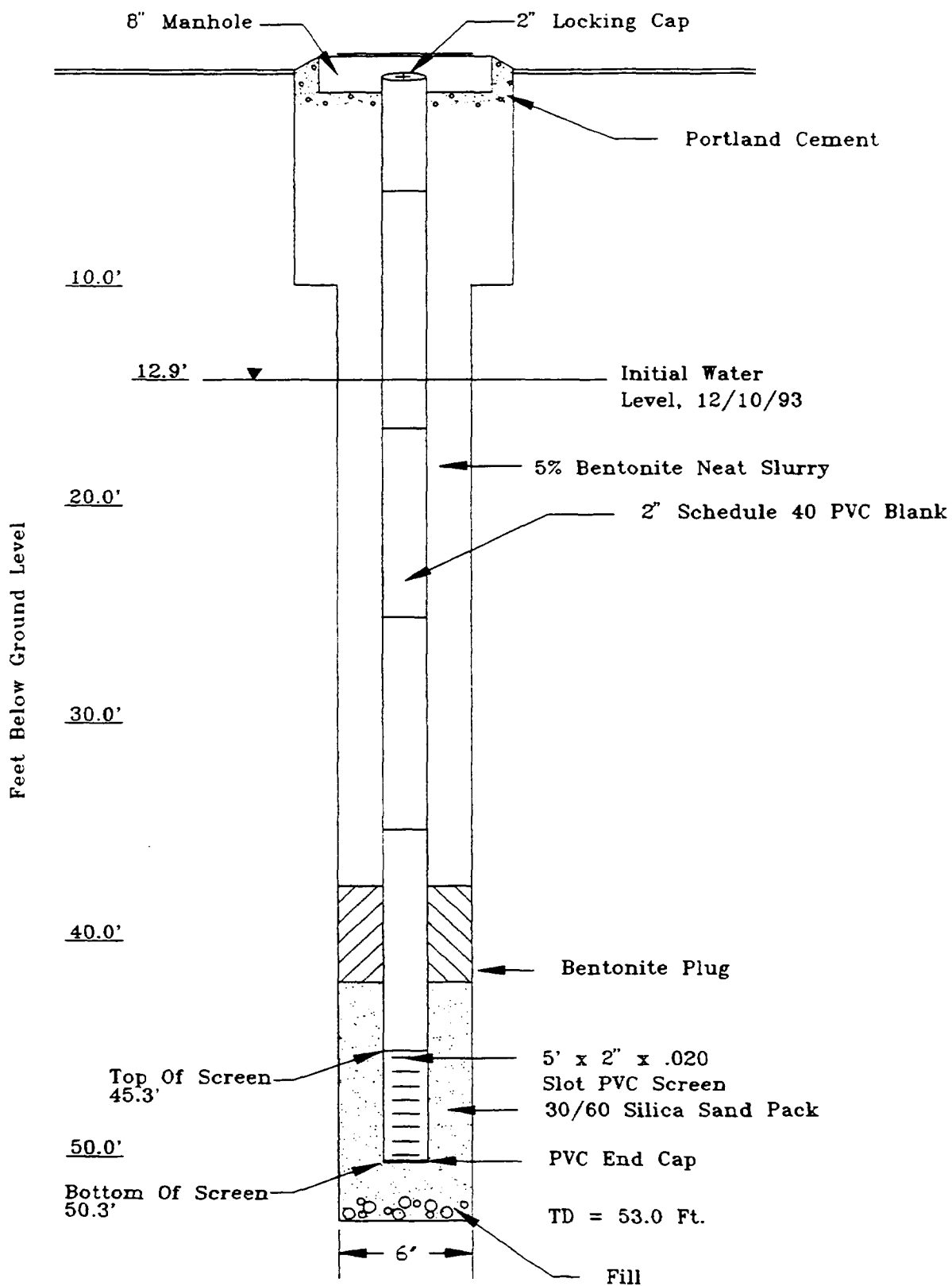
CK'D BY: L.J.M.

FILE: TT-1CD

WELL COMPLETION DIAGRAM

TT-1

TUT 005 1448



CLIENT: TEXACO-TUTU

DATE: 12-30-93

REV. NO.:

AUTHOR: L.J.M.

DRAWN BY: HCC

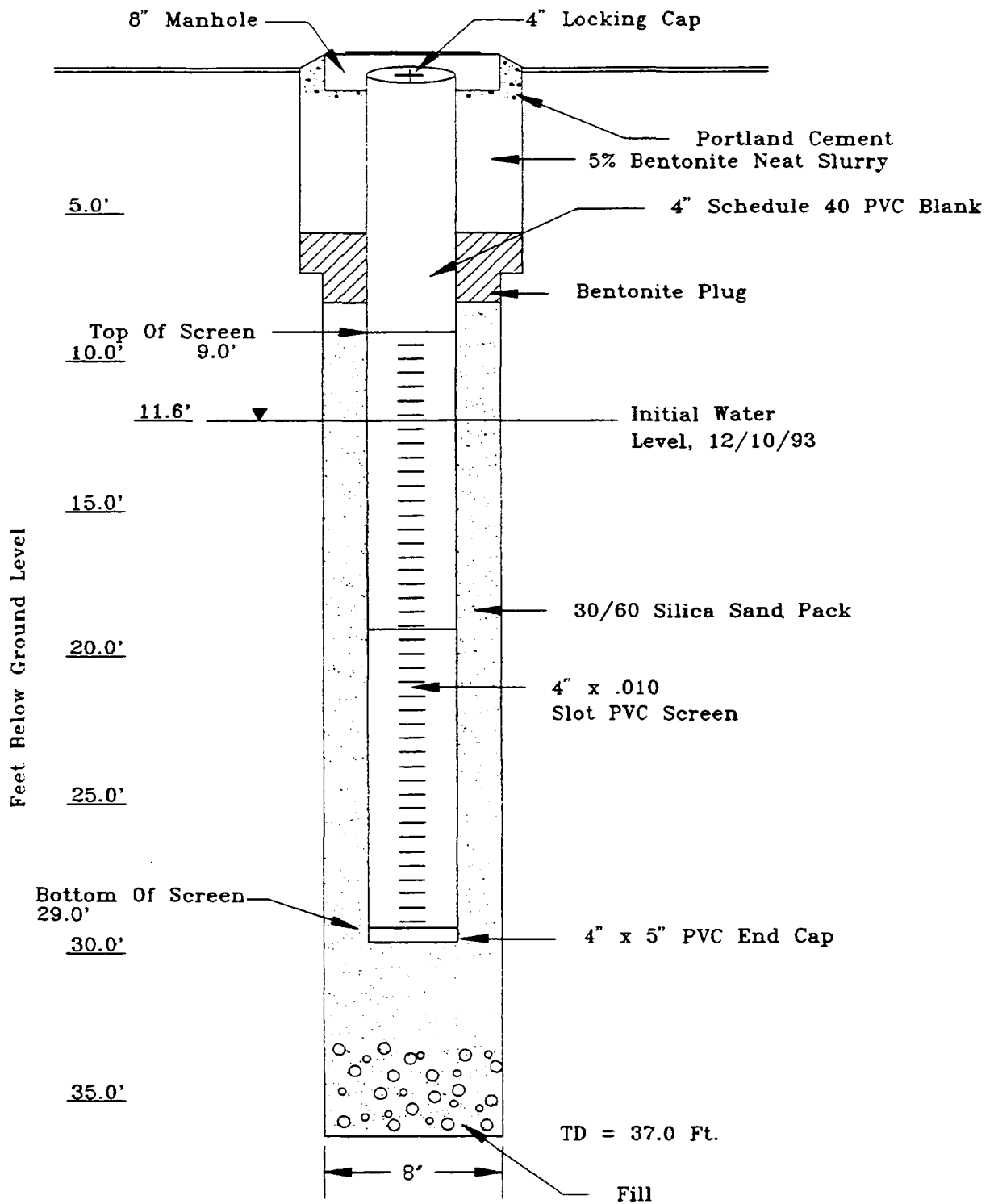
CK'D BY: L.J.M.

FILE: TT-1DCD

WELL COMPLETION DIAGRAM

TT-1d

TUT 005 1449



CLIENT: TEXACO-TUTU

DATE: 12-30-93

AUTHOR: L.J.M.

CK'D BY: L.J.M.

REV. NO.:

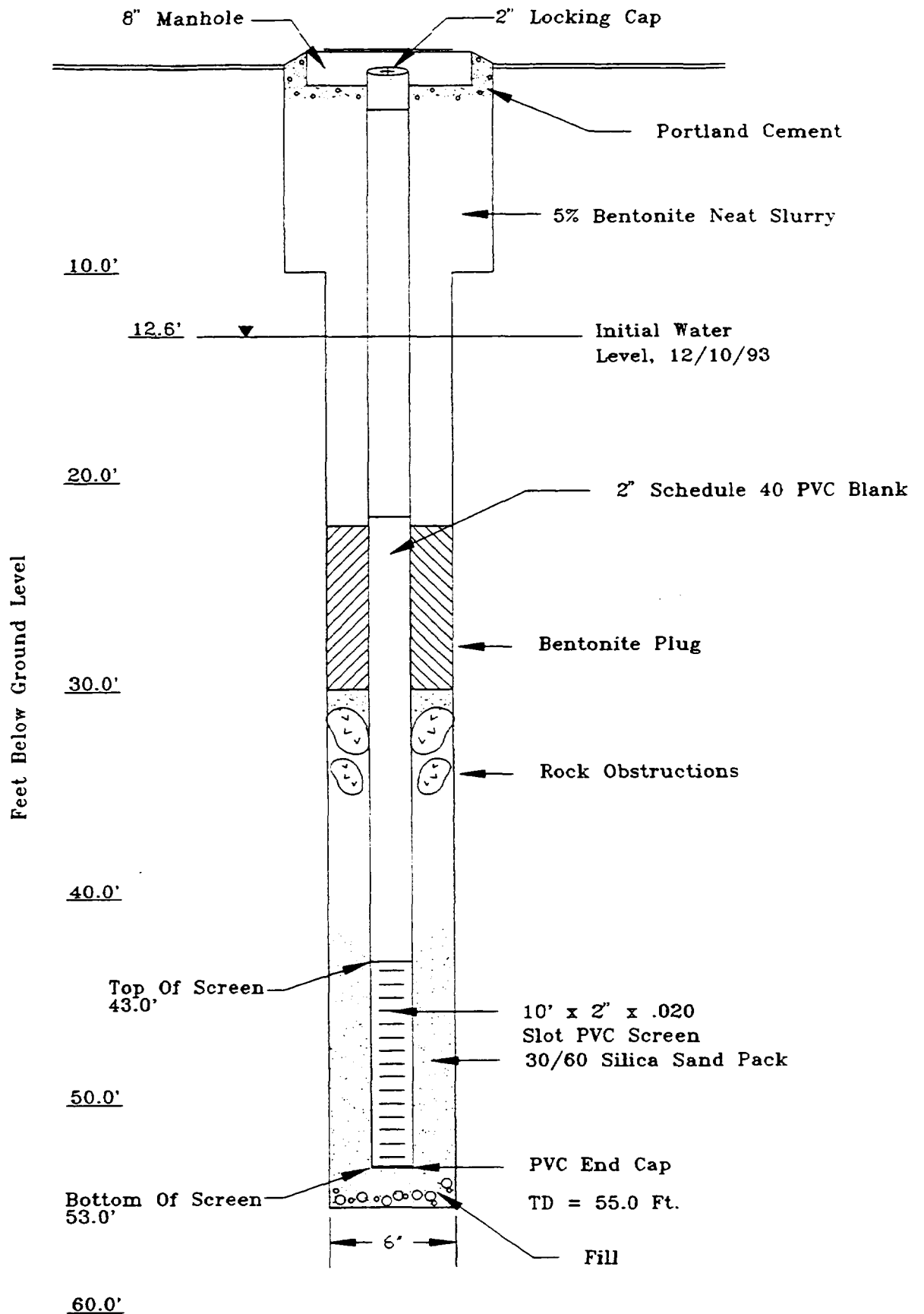
DRAWN BY: HCC

FILE: TT-2CD

WELL COMPLETION DIAGRAM

TT-2

TUT 005 1450



CLIENT: TEXACO-TUTU

DATE: 12-30-93

REV. NO.:

AUTHOR: L.J.M.

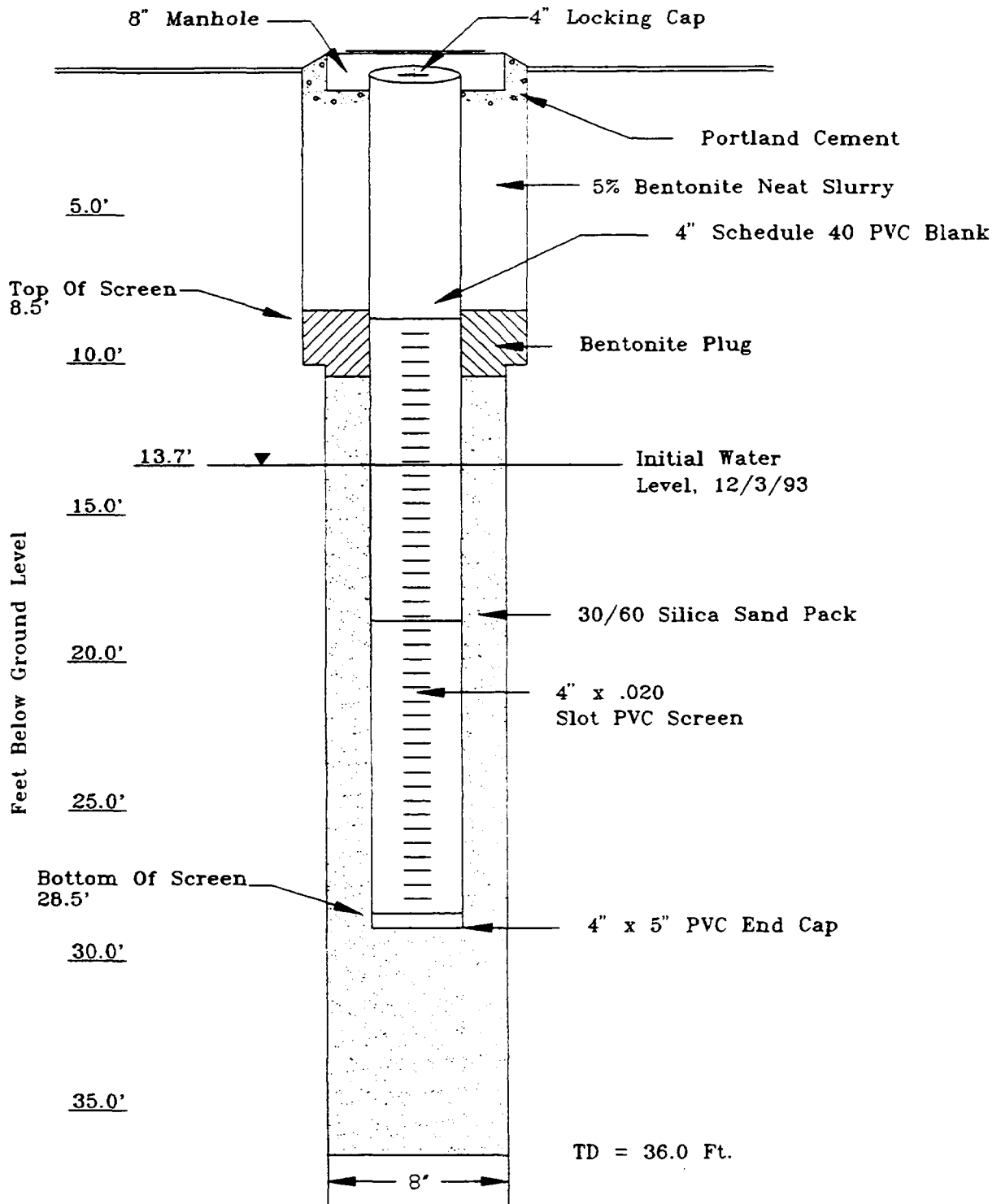
DRAWN BY: HCC

CK'D BY: L.J.M.

FILE: TT-3DCD

WELL COMPLETION DIAGRAM

TT-3d



Note : Excess screen above sand pack due to error in setting screen at bottom of hole.



CLIENT: TEXACO-TUTU

DATE: 12-30-93

REV. NO.:

AUTHOR: L.J.M.

DRAWN BY: HCC

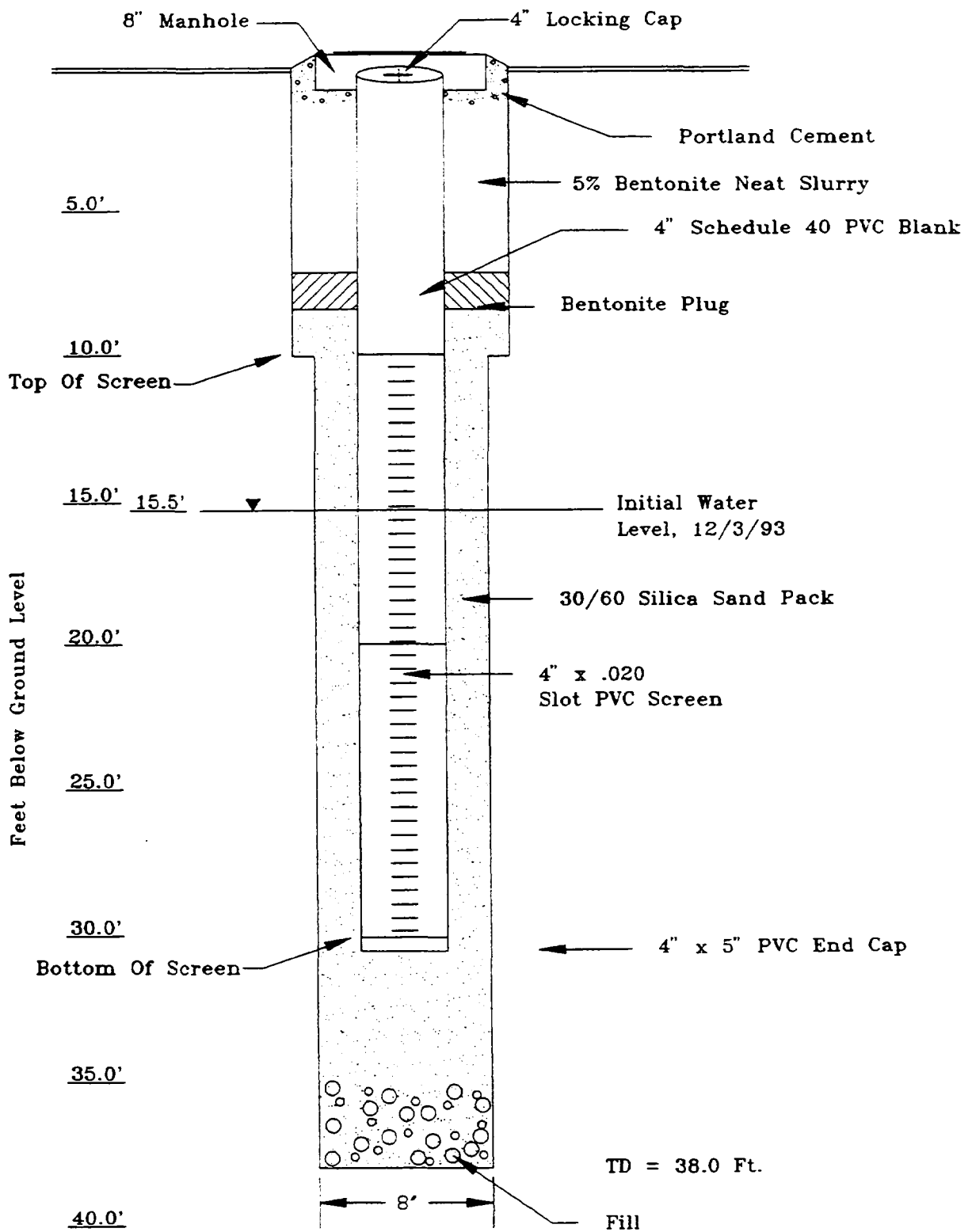
CK'D BY: L.J.M.

FILE: TT-4CD

WELL COMPLETION DIAGRAM

TT-4

TUT 005 1452



CLIENT: TEXACO-TUTU

DATE: 12-30-93

AUTHOR: L.J.M.

CK'D BY: L.J.M.

REV. NO.:

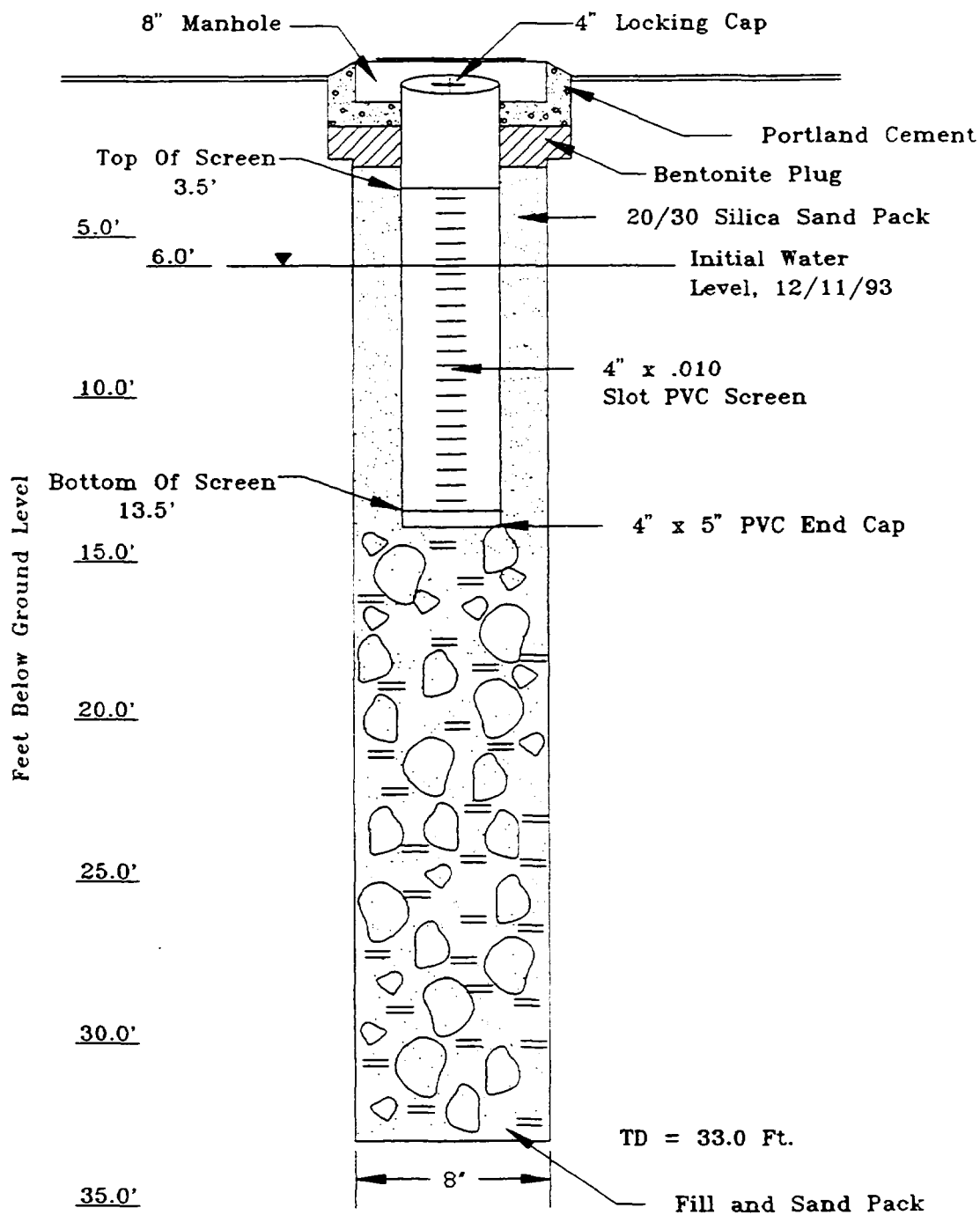
DRAWN BY: HCC

FILE: TT-5CD

WELL COMPLETION DIAGRAM

TT-5

TUT 005 1453



CLIENT: TEXACO-TUTU	
DATE: 12-30-93	REV. NO.:
AUTHOR: L.J.M.	DRAWN BY: HCC
CK'D BY: L.J.M.	FILE: TT-6CD

WELL COMPLETION DIAGRAM
TT-6

Appendix E — Monitor Well Development and Groundwater Sampling Data Forms, Texaco Tutu Investigation, December 1993

MONITOR WELL DEVELOPMENT

WELL: TT-1 (TEXACO TUTOR) 4" Well

Date	Time	Method	Delta Volume (gallons)	Total Volume (gallons)	pH	°F	Cond	Turbidity (NTU)	Initials	Comments
12/9/93	1114	Pump	10	10	7.33	93.5	1788	—	Ph	Cloudy, pumping from bottom of screen
"	1116	"	20	30	7.21	93.6	1902	—	Ph	" " " "
"	1118	"	20	50	7.30	93.8	1936	—	Ph	" " " "
"	1121	"	30	80	7.36	93.1	1961	—	Ph	Sl. Cloudy, " " " "
"	1123	"	20	100	7.34	92.4	1686	—	Ph	Murky, " " " "
"	1125	"	20	120	7.14	91.2	1920	—	Ph	Fairly Clear, " " " "
"	1129	"	40	160	7.28	91.5	1943	—	Ph	" " " " "
"	1131	"	20	180	7.26	91.2	1924	—	Ph	" " " " "
"	1132	— Stop Pumping								
			TOTAL OF 180 gallons ≈ 16 Column Volumes							

Water level pre-development: _____ post-development: _____

Well was developed with submersible pump @ ~ 10 gpm; well would go dry if pump was lifted from bottom of screen. well redrings ~ 10 gpm.

Ground-Water Sampling Data Sheet

Page 1 of 1

Well ID TT-1 Date 12/10/93 Project TEXACO TINTN
 Project No. 54173.04 Samplers P. Montano Ground Elevation _____
 TOC Elevation _____ Screened Interval (Below Surface) 10' - 30'
 Casing Diameter (ID, ft.) 4" Material PRC Well Depth (from TOC) 30.8'
 Water Level (From North Side, Inner Well Casing) 12.45 Water Column Length (ft.) 18.35
 Gallons/Ft. 0.65 Casing Vol. (gals.) 11.93 x 3 = Purge Vol. 35.78
 Gals./ft. = $[(\text{casing diam. (ft.)}^2 \times \pi) \times 7.48]$ Water Level Probe ID OIL/WATER INTERFACE
 PID Reading (background) 0 Purging Method 3 1/2" BAKER Sampling Method DEP. BAILER
 Discharge Water to TANK #1 Condition of well Good (New Well)

Comments:

Military Time HH:MM	Pumping Rate (GPM)	Cum Vol. of Water Removed Gals.	Cum Vol. of Water Casing Vol.	PID Reading Locn. Value	pH	Temp. °F	EC umhos/cm	Comments
1510	Hand	3	3	WH 393	7.14	89.4	1934	Murky, Hydro Odor
1512	Bailer	2	5		7.16	87.6	1900	" "
1514		5	10		7.19	88.3	1822	" "
1519		5	15		7.31	89.3	1840	" "
1524		5	20		7.40	89.3	1839	" "
1529		5	25		7.36	89.4	1830	" "
1535		10	35		7.34	89.6	1831	" "
Final Field Chemistry Measurements								

Total Volume Purged (Gallons): 35 Remarks:

Note: Field instrument calibrations must be logged in logbook prior to sampling.

TINTN + Xylenes

Analytes	VOCs (EPA 8240)	Fuels (EPA 8015)	PCBs (EPA 8080)	Unfilt Metals	Comments
Bottle Type	2x40 ml G	2x40 ml G	1x5 lit AG	1x500 ml P	
Preservative	HCL			HNO ₃ , pH<2	
Temperature	4 °C	4 °C	4 °C	4 °C	
Filtered	NO				
Sample Number	9312101540				
Duplicate Sample Number	9312101545				
Total # Bottles	6-40 ml.				
CoC Form #	7666				

Signed: P. MontanoDate: 12/10/93

GEWORK/SAMPDAT1.FRM

TUT 005 1457

MONITOR WELL DEVELOPMENT

WELL: TT-1d (Tutu Texaco) 2" well

Date	Time	Method	Delta Volume (gallons)	Total Volume (gallons)	pH	°F T°C	Cond	Turbidity (NTU)	Initials	Comments
12/1/93	1524	Hand Bzil	1	1	8.88	87.6	1731	—	DM	Gas Odor
"	1531	"	2	3	8.06	91.8	1745	—	DM	" "
"	1536	"	2	5	7.63	91.1	1528	—	DM	Fairly Clear, Gas Odor
"	1550	"	2	7	7.73	87.2	1386	—	DM	Little Turbid
"	1557	"	3	10	7.72	88.8	1351	—	DM	" "
"	1602	"	2	12	7.55	87.2	1344	—	DM	" "
"	1608	"	3	15	7.53	86.4	1322	—	DM	" "
TOTAL 15 gals. ≈ 3 Column Volumes										

Water level pre-development: 12.90' post-development: _____
 13 TOC

Well was developed w/ 1 1/2" disposable
 biter

Ground-Water Sampling Data Sheet

Page 1 of 1

Well ID TT-1d Date 12/10/93 Project TEXACO TUN
 Project No. 54173-04 Samplers P. Montano Ground Elevation _____
 TOC Elevation _____ Screened Interval (Below Surface) 45.3' - 50.3'
 Casing Diameter (ID, ft.) 2" Material PVC Well Depth (from TOC) 50.3'
 Water Level (From North Side, Inner Well Casing) 12.92 Water Column Length (ft.) 37.38'
 Gallons/Ft. 0.16 Casing Vol. (gals.) 5.98 x 3 = Purge Vol. 17.94
 Gals./ft. = $(((\text{casing diam. (ft.)}^2 \times \pi) \times 7.48)$ Water Level Probe ID OIL/WATER INTERFACE
 PID Reading (background) 0 Purging Method Dis. Bzib Sampling Method Dis. BAKER (New)
 Discharge Water to TANK #1 Condition of well Good (New well)

Comments: _____

Military Time HH:MM	Pumping Rate (GPM)	Cum Vol. of Water ▲ Removed ▼ Gals. Casing Vols.		PID Reading ppm Locn. Value		pH	Temp. °F	EC umhos/cm	Comments
1410	HAND	2	2	WH	53	7.34	40.2	1384	fairly Clear H2O odor
1415	PAUSED	3	5			7.44	41.4	1364	" " "
1418		2	7			7.32	43.0	1394	" " "
1420		3	10			7.24	43.1	1382	" " "
1425		5	15			7.19	43.4	1392	" " "
1430		3	18			7.26	44.1	1388	" " "
Final Field Chemistry Measurements									

Total Volume Purged (Gallons): 18 Remarks: _____

Note: Field instrument calibrations must be logged in logbook prior to sampling.

+MTBE + Xylenes

Analytes	VOCs (EPA 8240)	Fuels (EPA 8015)	PCBs (EPA 8080)	Unfilt Metals	Comments
Bottle Type	3 2x40 ml G	2x40 ml G	1x5 lit AG	1x500 ml P	
Preservative	HCL			HNO ₃ , pH<2	
Temperature	4 °C	4 °C	4 °C	4 °C	
Filtered	NO				
Sample Number	9312101445				
Duplicate Sample Number	_____				
Total # Bottles	3-40 ml.				
CoC Form #	7666				

Signed: P. MontanoDate: 12/10/93

GEWORK/SAMPDAT1.FRM

TUT 005 1459

MONITOR WELL DEVELOPMENT

WELL: TT-2 (TEXACO TUTU) 4" Well

Date	Time	Method	Delta Volume (gallons)	Total Volume (gallons)	pH	° F	Cond	Turbidity (NTU)	Initials	Comments
12/9/93	1042	Pump	15	15	7.00	88.9	1309	—	PM	Cloudy, pumping from bottom of screen
"	1044	"	15	30	7.05	89.4	1302	—	PM	Sl. Cloudy, " " " " "
"	1046	"	20	50	7.10	89.8	1232	—	PM	" " " " " "
"	1048	"	20	70	7.01	89.4	1272	—	PM	Murky, pumping @ 7' Above bottom of screen
"	1050	"	20	90	7.04	89.4	1268	—	PM	Sl. Murky, " " " " "
"	1052	"	20	110	7.13	89.7	1309	—	PM	Murky, pumping from bottom of screen
"	1054	"	20	130	7.14	90.3	1296	—	PM	Sl. Murky, " " " " "
"	1056	"	20	150	7.25	90.1	1326	—	PM	" " " " " "
"	1058	"	20	170	7.17	90.5	1312	—	PM	" " " " " "
"	1100	"	20	190	7.16	89.9	1321	—	PM	Fairly Clear, " " " " "
1101 - Stop pumping: Total of 200 gallons $\approx$ 17 Column Volumes										

Water level pre-development: _____ post-development: _____

Well was developed with submersible pump @ $\approx$ 10 gpm; well was pumped continuously and didn't go dry; well recharge $\approx$ 10 gpm

Ground-Water Sampling Data Sheet

Page 1 of 1

Well ID TT-2 Date 12/10/93 Project TEXACO TWTU
 Project No. 54173-04 Samplers P-Montana Ground Elevation _____
 TOC Elevation _____ Screened Interval (Below Surface) 9' to 29'
 Casing Diameter (ID, ft.) 4" Material PVC Well Depth (from TOC) 29.6'
 Water Level (From North Side, Inner Well Casing) 11.63 Water Column Length (ft.) 17.97'
 Gallons/Ft. 0.65' Casing Vol. (gals.) 11.68 x 3 = Purge Vol. 35.04
 Gals./ft. = $\frac{[(\text{casing diam. (in)})^2 \times \pi]}{4} \times 7.48$ Water Level Probe ID OIL/WATER Interface
 PID Reading (background) 0 Purging Method 3 1/2" Baker Sampling Method Disp. Baker (New)
 Discharge Water to Taritz #1 Condition of well Good (New Well)

Comments:

Military Time HH:MM	Pumping Rate (GPM)	Cum Vol. of Water Δ Removed & Gals. Casing Vols.		PID Reading ppm Locn. Value		pH	Temp. °F	EC umhos/cm	Comments
1045	HAND	3	3	WH	Ø	7.02	84.2	1390	Murky
1051	PAIRED	7	10			6.98	84.6	1363	"
1055		5	15			7.46	85.3	1347	"
1057		5	20			7.04	84.3	1362	"
1059		5	25			7.10	86.1	1352	"
1101		5	30			7.14	85.2	1350	"
1105		5	35			7.09	84.6	1354	"
Final Field Chemistry Measurements									

Total Volume Purged (Gallons): 35 Remarks: _____

Note: Field instrument calibrations must be logged in logbook prior to sampling.

+ mTBE + xylenes

Analytes	VOCs (EPA 8240)	Fuels (EPA 8015)	PCBs (EPA 8080)	Unfilt Metals	Comments
Bottle Type	3 2x40 ml G	2x40 ml G	1x5 lit AG	1x500 ml P	
Preservative	HCL			HNO ₃ pH<2	
Temperature	4 °C	4 °C	4 °C	4 °C	
Filtered	NO				
Sample Number	9312101115				
Duplicate Sample Number	—				
Total # Bottles	3-40 ml.				
CoC Form #	7666				

Signed: P. MontanaDate: 12/10/93 GEWORK/SAMPDAT1.FRM

TUT 005 1461

MONITOR WELL DEVELOPMENT

WELL: TT-3x1 (TEXACO TUTU) 2" well

[illegible]

Water level pre-development: 12.55' post-development: _____
BTOL

Well was developed w/ 1 1/2" disposable filter.

Ground-Water Sampling Data Sheet

Page 1 of 1

Well ID TT-3d Date 12/10/93 Project TEXACO TUTU
 Project No. 54173-04 Samplers P. Montano Ground Elevation _____
 TOC Elevation _____ Screened Interval (Below Surface) 43' - 53'
 Casing Diameter (ID, ft.) 2" Material PVC Well Depth (from TOC) 53.0
 Water Level (From North Side, Inner Well Casing) 12-6' Water Column Length (ft.) 40.40'
 Gallons/Ft. 0.16 Casing Vol. (gals.) 6.46 x 3 = Purge Vol. 19.39

Gals./ft. = $\frac{((\text{casing diam. (ft.)}^2 \times \pi) \times 7.48)}{4}$ Water Level Probe ID Oil/WATER INTERFACE

ppm PID Reading (background) 0 Purging Method Drp-Bailer Sampling Method Disp-Bailer (New)

Discharge Water to Tank #1 Condition of well Good, New Well

Comments:

Military Time HH:MM	Pumping Rate (GPM)	Cum Vol. of Water Δ Removed Gals. Casing Vols.		PID Reading ppm Locn. Value		pH	Temp. °F	EC umhos/cm	Comments
0809	HAND	2	2	WH	Ø	7.42	80.7	1100	Fairly Clear
0813	BAILED	2	4			7.38	82.3	1058	" "
0823		4	8			7.24	83.1	1081	" "
0833		5	13			7.58	82.5	1074	Clear
0836		2	15			7.34	81.5	1056	"
0850		3	18			7.38	80.4	1048	"
0856		2	20			7.40	80.9	1066	"
Final Field Chemistry Measurements									

Total Volume Purged (Gallons): 20 Remarks:

Note: Field instrument calibrations must be logged in logbook prior to sampling.

✓ TMTBE + xylenes

Analytes	VOCs (EPA 8240)	Fuels (EPA 8015)	PCBs (EPA 8080)	Unfilt Metals	Comments
Bottle Type	3 2x40 ml G	2x40 ml G	1x5 lit AG	1x500 ml P	
Preservative	HCL			HNO ₃ , pH<2	
Temperature	4 °C	4 °C	4 °C	4 °C	
Filtered	NO				
Sample Number	93121009105				
Duplicate Sample Number	N/A				
Total # Bottles	3-40ml.				
CoC Form #	7666				

Signed: P. MontanoDate: 12/10/93

GEWORK/SAMPDAT1.FRM

TUT 005 1463

MONITOR WELL DEVELOPMENT

WELL: TT-4 (TEXACO TUTU) 4" Well

Date	Time	Method	Delta Volume (gallons)	Total Volume (gallons)	pH	°F	Cond	Turbidity (NTU)	Initials	Comments
12/9/93	0900	Pump	10	10	7.51	91.6	1600	—	PM	Cloudy, pumping from bottom of Screen
"	0905	"	10	20	7.62	90.4	1680	—	PM	Cloudy, " " " " "
										Generator malfunction
12/9/93	0930	Pump	10	30	7.15	87.4	1651	—	PM	Murky, pumping from bottom of Screen
"	0940	"	10	40	7.31	88.7	1731	—	PM	Murky, " " " " "
"	0950	"	10	50	7.28	90.3	1750	—	PM	Murky, " " " " "
"	1000	"	10	60	7.20	92.4	1839	—	PM	" " " " "
"	1010	"	10	70	7.22	93.3	1908	—	PM	" " " " "
"	1020	"	10	80	7.16	91.2	1821	—	PM	" " " " "
"	1030	"	10	90	7.20	91.2	1783	—	PM	" " " " "
TOTAL of 90 gallons ≈ 6 Column Volumes					9					

Water level pre-development: _____ post-development: _____

Well was developed with submersible pump @ ≈ 10 gpm; well would go dry after about 1 minute of pumping. Pump was restarted every 10 minutes; well recharge is ≈ 1 gpm.

Ground-Water Sampling Data Sheet

Page 1 of 1

Well ID TT-4 Date 12/10/93 Project TEXACO Tutu
 Project No. 54173-04 Samplers P. Montana Ground Elevation _____
 TOC Elevation _____ Screened Interval (Below Surface) 8.5'-28.5'
 Casing Diameter (ID, ft.) 4" Material PVC Well Depth (from TOC) 29.1
 Water Level (From North Side, Inner Well Casing) 13.73' Water Column Length (ft.) 15.37
 Gallons/Ft. 0.65 Casing Vol. (gals.) 9.99 x 3 = Purge Vol. 29.97

Gals./ft. = $[(\text{casing diam. (ft)}^2) \times \pi] \times 7.48$ Water Level Probe ID OIL/WATER InterfacePID Reading (background) 0 Purging Method 3 1/2" BAKER Sampling Method Disp. BAILER (New)Discharge Water to TANK #1 Condition of well Good (NEW WELL)

Comments: _____

Military Time HH:MM	Pumping Rate (GPM)	Cum Vol. of Water Δ Removed ∇ Gals. Casing Vols.		PID Reading ppm Locn. Value		pH	Temp. °F	EC umhos/cm	Comments
1200	HAND	3	3	WH	243	7.63	84.7	1721	Murky Hydro odor
1204	BAILED	2	5			7.54	84.6	1740	" "
1207		5	10			7.43	85.8	1762	" "
1209		5	15			7.63	84.6	1702	" "
1211		5	20			7.52	84.9	1684	" "
1214		5	25			7.46	84.3	1688	" "
1217		5	30			7.50	84.4	1689	" "
Final Field Chemistry Measurements									

Total Volume Purged (Gallons): 30 Remarks: _____

Note: Field instrument calibrations must be logged in logbook prior to sampling.

+MTBE + Xylenes

Analytes	VOCs (EPA 8240)	Fuels (EPA 8015)	PCBs (EPA 8080)	Unfilt Metals	Comments
Bottle Type	3 2x40 ml G	2x40 ml G	1x5 lit AG	1x500 ml P	
Preservative	HCL			HNO ₃ , pH<2	
Temperature	4 °C	4 °C	4 °C	4 °C	
Filtered	NO				
Sample Number	4312101230				
Duplicate Sample Number	—				
Total # Bottles	3-40 ml.				
CoC Form #	766				

Signed: P. MontanaDate: 12/10/93

GEWORK/SAMPDAT1.FRM

MONITOR WELL DEVELOPMENT

WELL: TT-5 (TEXACO TURTLE) 4" Well

Date	Time	Method	Delta Volume (gallons)	Total Volume (gallons)	pH	°F T _W	Cond	Turbidity (NTU)	Initials	Comments
12/4/93	1151	Pump	10	10	7.25	91.1	1977	—	PM	Cloudy, pumping from bottom of screen
"	1153	"	15	25	7.24	89.7	1854	—	PM	Sl. Cloudy, " " " " "
"	1155	"	20	45	7.38	89.6	1835	—	PM	Cloudy, pumping @ 6' from bottom of screen
"	1157	"	10	55	7.23	89.0	1914	—	PM	" " " " " "
"	1200	"	25	80	7.30	88.5	1873	—	PM	Fairly Clear, pumping from bottom of screen
"	1202	"	15	95	7.22	88.4	1843	—	PM	" " " " " "
"	1203	"	10	105	7.23	88.3	1841	—	PM	" " " " " "
TOTAL OF 105 Gallons $\approx$ 11 Column Volumes										

Water level pre-development: _____ post-development: _____

Well was developed with submersible pump
 @ $\approx$ 10 gpm; well was pumped continuously
 and did not go dry. Well recharge $\approx$ 10 gpm

Ground-Water Sampling Data Sheet

Page 1 of 1

Well ID TT-5 Date 12/10/93 Project TEXACO TULU
 Project No. 54173-04 Samplers P-Montano Ground Elevation _____
 TOC Elevation _____ Screened Interval (Below Surface) 10' - 30'
 Casing Diameter (ID, ft.) 4" Material PVC Well Depth (from TOC) 30.4'
 Water Level (From North Side, Inner Well Casing) 15.5' Water Column Length (ft.) 14.9'
 Gallons/Ft. 0.65 Casing Vol. (gals.) 9.69 x 3 = Purge Vol. 29.06

Gals./ft. = $(((\text{casing diam. (ft.)}^2 \times \pi) \times 7.48)$ Water Level Probe ID OIL/WATER Interface

ppm PID Reading (background) 0 Purging Method 3 1/2" Bailer Sampling Method Disposable Bailer (New)
 Discharge Water to Trunk #1 Condition of well Good (New Well)

Comments:

Military Time HH:MM	Pumping Rate (GPM)	Cum Vol. of Water Δ Removed Gals. Casing Vols.		PID Reading ppm Locn. Value		pH	Temp. °F	EC umhos/cm	Comments
0438	HAND	3	3	W4	36	7.67	81.7	1916	Cloudy
0441	BAIL	3	6			7.26	84.1	1893	"
0444		4	10			7.44	83.5	1846	"
0449		5	15			7.43	83.1	1622	Murky
0452		5	20			7.62	84.1	1590	"
0456		5	25			7.64	83.3	1544	Slightly Murky
0459		5	30			7.60	83.2	1560	" "
Final Field Chemistry Measurements									

Total Volume Purged (Gallons): 30 Remarks:

Note: Field instrument calibrations must be logged in logbook prior to sampling.

+ MTR + xylene

Analytes	VOCs (EPA 8240)	Fuels (EPA 8015)	PCBs (EPA 8080)	Unfilt Metals	Comments
Bottle Type	3 2x40 ml G	2x40 ml G	1x5 lit AG	1x500 ml P	
Preservative	HCL			HNO ₃ pH<2	
Temperature	4 °C	4 °C	4 °C	4 °C	
Filtered	No				
Sample Number	4312101010				
Duplicate Sample Number	—				
Total # Bottles	3-40ml.				
CoC Form #	7666				

Signed: P. MontanoDate: 12/10/93 GEWORK/SAMPDAT1.FRM

TUT 005 1467

Ground-Water Sampling Data Sheet

Page 1 of 1

Well ID T7-6 Date 12/11/93 Project TEXACO TULSA
 Project No. 7473-02 Samplers P. Montano Ground Elevation _____
 TOC Elevation _____ Screened Interval (Below Surface) 3.5' - 13.5'
 Casing Diameter (ID, ft.) 4" Material PVC Well Depth (from TOC) 13.5'
 Water Level (From North Side, Inner Well Casing) 6.0' Water Column Length (ft.) 7.5'
 Gallons/Ft. 0.165 Casing Vol. (gals.) 4.88 x 3 = Purge Vol. 14.63
 Gals./ft. = $\frac{((\text{casing diam. (ft.)}^2 \times \pi) \times 7.48)}{4.71}$ Water Level Probe ID OIL/WATER INTERFACE
 PID Reading (background) 0 Purging Method 3 1/2" BAILED Sampling Method DISP. BAILED (NEW)
 Discharge Water to TANK #1 Condition of well Good, New well

Comments:

Military Time HH:MM	Pumping Rate (GPM)	Cum Vol. of Water Removed Gals. Casing Vol.	PID Reading ppm Locn. Value	pH	Temp. °C	EC umhos/cm	Comments
1100	HAND	1.5	1.5	WH	0	7.05 89.8	1293 little turbid
1104	BAILED	3.5	5			6.90 89.6	1297 little Muddy
1108		5	10			6.93 88.2	1301 " "
1112		5	15			7.24 87.6	1301 " "
1117		5	20			7.27 86.2	1289 " "
1120		8	28			7.30 86.7	1293 " "
Final Field Chemistry Measurements							

Total Volume Purged (Gallons): 28 Remarks: _____

Note: Field instrument calibrations must be logged in logbook prior to sampling.

MTBE + Xylenes

Analytes	VOCs (EPA 8240)	Fuels (EPA 8015)	PCBs (EPA 8080)	Unfilt Metals	Comments
Bottle Type	<u>2</u> 2x40 ml G	2x40 ml G	1x5 lit AG	1x500 ml P	
Preservative	<u>HCL</u>			<u>HNO₃ pH<2</u>	
Temperature	<u>4 °C</u>	<u>4 °C</u>	<u>4 °C</u>	<u>4 °C</u>	
Filtered	<u>NO</u>				
Sample Number	<u>931211130</u>				
Duplicate Sample Number	_____				
Total # Bottles	<u>3-40ml</u>				
CoC Form #	<u>7607</u>				

Signed: P. MontanoDate: 12/11/93

GEWORK/SAMPDAT1.FRM

TUT 005 1459

Ground-Water Sampling Data Sheet

Page 1 of 1

Well ID MW-3 Date 12-7-93 Project TEXACO Tula
 Project No. 54173.04 Samplers P-Montano Ground Elevation _____
 TOC Elevation _____ Screened Interval (Below Surface) 10.4' - 30.4'
 Casing Diameter (ID, ft.) 4" Material Stainless Well Depth (from TOC) 30.35'
 Water Level (From North Side, Inner Well Casing) 13.25' Water Column Length (ft.) 17.10'
 Gallons/Ft. 0.65 Casing Vol. (gals.) 11.12 x 3 = Purge Vol. 33.35
 Gals./ft. = $\frac{((\text{casing diam. (ft.)}^2 \times \pi) \times 7.48)}{4}$ Water Level Probe ID OIL/WATER INTERFACE
 PID Reading (background) 0 Purging Method 3 1/2" Bailor Sampling Method Dis. Bailor (New)
 Discharge Water to Tank #2 Condition of well Good

Comments:

Military Time HH:MM	Pumping Rate Rate (GPM)	Cum Vol. of Water Δ Removed ↓ Gals. Casing-Vol.		PID Reading ppm Locn. Value		pH	Temp. °F	EC umhos/cm	Comments
1333	HAND	2	2	WH	4.3	7.68	89.3	987	Cloudy
1339	BAIL	4	6			7.38	88.9	977	"
1345		5	11			7.62	89.2	978	"
1350		5	16			7.44	88.2	987	"
1355		5	21			7.46	88.1	984	"
1359		5	26			7.43	88.3	988	"
1405		8	34			7.42	88.4	993	"
Final Field Chemistry Measurements									

Total Volume Purged (Gallons): 34 Remarks:

Note: Field instrument calibrations must be logged in logbook prior to sampling.

+ MTBE + Xylenes

Analytes	VOCs (EPA 8240)	Fuels (EPA 8015)	PCBs (EPA 8080)	Unfilt Metals	Comments
Bottle Type	<u>2x40 ml G</u>	<u>2x40 ml G</u>	<u>1x5 lit AG</u>	<u>1x500 ml P</u>	
Preservative	<u>HCL</u>			<u>HNO₃, pH<2</u>	
Temperature	<u>4 °C</u>	<u>4 °C</u>	<u>4 °C</u>	<u>4 °C</u>	
Filtered	<u>No</u>				
Sample Number	<u>931207/430</u>				
Duplicate Sample Number					
Total # Bottles	<u>3-40ml.</u>				
CoC Form #	<u>7664</u>				

Signed: Red MontanoDate: 12/7/93

GEWORK/SAMPDAT1.FRM

Ground-Water Sampling Data Sheet

Page 1 of 1

Well ID MW-4 Date 12-7-93 Project TEXAS TUNA
 Project No. 54173.04 Samplers P. Montano Ground Elevation _____
 TOC Elevation _____ Screened Interval (Below Surface) 7' - 27'
 Casing Diameter (ID, ft.) 4" Material Steel Well Depth (from TOC) 27.0'
 Water Level (From North Side, Inner Well Casing) 7.95' Water Column Length (ft.) 19.05'
 Gallons/Ft. 0.65 Casing Vol. (gals.) 12.43 x 3 = Purge Vol. 37.3

Gals./ft. = $[(\text{casing diam. (ft.)}^2 \times \pi) \times 7.48]$ Water Level Probe ID OIL/WATER INTERFACE

ppm PID Reading (background) 0 Purging Method 3 1/2" BAILEY Sampling Method Disp. K211 lon (H2O)

Discharge Water to TANK #2 Condition of well Good

Comments:

Military Time HH:MM	Pumping Rate (GPM)	Cum Vol. of Water Removed Gals. Casing Vol.		PID Reading ppm Locn. Value		pH	Temp. °F	EC umhos/cm	Comments
0914	Hand	2	2	WH	0	6.99	86.4	1554	Cloudy
0920	PAUL	4	6			7.24	86.7	1559	"
0925		5	11			7.19	85.3	1481	"
0930		5	16			7.18	84.7	1461	"
0935		5	21			7.19	84.4	1464	"
0940		5	26			7.16	84.4	1442	"
0943		5	31			7.21	84.3	1446	"
0950		9	40			7.19	84.3	1444	"
Final Field Chemistry Measurements									

Total Volume Purged (Gallons): 40 Remarks:

Note: Field instrument calibrations must be logged in logbook prior to sampling.

+ MTBE + Xylenes

Analytes	VOCs (EPA 8240)	Fuels (EPA 8015)	PCBs (EPA 8080)	Unfilt Metals	Comments
Bottle Type	3	2x40 ml G	2x40 ml G	1x5 lit AG	1x500 ml P
Preservative	HCL			HNO ₃ pH<2	
Temperature	4 °C	4 °C	4 °C	4 °C	
Filtered	NO				
Sample Number	931207/000				
Duplicate Sample Number					
Total # Bottles	3-40ml-				
CoC Form #	7664				

Signed: P. MontanoDate: 12/7/93

GEWORK/SAMPDAT1.FRM

TUT 005 1471

Ground-Water Sampling Data Sheet

Page 1 of 1

Well ID MW-4d Date 12/9/93 Project TEXACO TURN
 Project No. 54173.04 Samplers P. Morton Ground Elevation _____
 TOC Elevation _____ Screened Interval (Below Surface) 47.7' - 71'
 Casing Diameter (ID, ft.) 6" Material Stainless Steel Well Depth (from TOC) 71.0'
 Water Level (From North Side, Inner Well Casing) 8.95' Water Column Length (ft.) 62.05'
 Gallons/Ft. 1.47 Casing Vol. (gals.) 91.13 x 3 = Purge Vol. 273.4

Gals./ft. = $\frac{((\text{casing diam. (in)}^2) \times \pi) \times 7.48}{4}$ Water Level Probe ID OIL/WATER INTERFACEppm PID Reading (background) 0 Purging Method Sub pump Sampling Method Disp. Bottle/FlowDischarge Water to Tank #1 Condition of well GOOD

Comments:

Military Time HH:MM	Pumping Rate (GPM)	Cum Vol. of Water Δ Removed & Gals. - Casing Vols.		PID Reading <i>ppm</i> Locn. Value		pH	Temp. °F	EC umhos/cm	Comments
1222	10	10	10	WH	0	7.37	91.6	1532	Clear
1223		10	20			7.45	90.8	1498	"
1228			60	Resume pumping					
1232		40	60			7.38	88.8	1447	Clear
1236		40	100			7.37	86.9	1441	"
1238		20	120			7.33	87.3	1444	"
1241		30	150			7.37	87.9	1448	"
Final Field Chemistry Measurements									

Total Volume Purged (Gallons): 160 Remarks: Generator refueled (1224)

Note: Field instrument calibrations must be logged in logbook prior to sampling.

+MIBK + Xylanes

Analytes	VOCs (EPA 8240)	Fuels (EPA 8015)	PCBs (EPA 8080)	Unfilt Metals	Comments
Bottle Type	3 2x40 ml G	2x40 ml G	1x5 lit AG	1x500 ml P	
Preservative	HCL			HNO ₃ , pH<2	
Temperature	4 °C	4 °C	4 °C	4 °C	
Filtered	NO				
Sample Number	931209/1245				
Duplicate Sample Number					
Total # Bottles	3-40ml				
CoC Form #	76166				

Signed: P. MortonDate: 12/9/93

GEWORK/SAMPDAT1.FRM

TUT 005 1472

Appendix F — Laboratory Analytical Data Sheets for Soil Samples, Texaco Tutu, December 1993

TCL Volatile Organics

Method 8240

#9311301630

SB-1 (3.0' - 3.5')

 Client Name: H+GCL
 Client ID: SB-1 (3')
 Lab ID: 031950-0007-SA
 Matrix: SOIL

 Sampled: 30 NOV 93
 Received: 03 DEC 93
 Authorized: 05 DEC 93

 Prepared: NA
 Analyzed: 09 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	12
tert-Butyl Methyl ether	ND	ug/kg	6.1
Bromomethane	ND	ug/kg	12
Vinyl Chloride	ND	ug/kg	12
Chloroethane	ND	ug/kg	12
Methylene chloride	ND	ug/kg	6.1
Acetone	8.6	ug/kg	12
Carbon disulfide	ND	ug/kg	6.1
1,1-Dichloroethene	ND	ug/kg	6.1
1,1-Dichloroethane	ND	ug/kg	6.1
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.1
Chloroform	ND	ug/kg	6.1
1,2-Dichloroethane	ND	ug/kg	6.1
2-Butanone	ND	ug/kg	12
1,1,1-Trichloroethane	ND	ug/kg	6.1
Carbon tetrachloride	ND	ug/kg	6.1
Vinyl Acetate	ND	ug/kg	12
Bromodichloromethane	ND	ug/kg	6.1
1,2-Dichloropropane	ND	ug/kg	6.1
cis-1,3-Dichloropropene	ND	ug/kg	6.1
Trichloroethene	ND	ug/kg	6.1
Dibromochloromethane	ND	ug/kg	6.1
1,1,2-Trichloroethane	ND	ug/kg	6.1
Benzene	ND	ug/kg	6.1
trans-1,3-Dichloropropene	ND	ug/kg	6.1
Bromoform	ND	ug/kg	6.1
4-Methyl-2-Pentanone	ND	ug/kg	12
2-Hexanone	ND	ug/kg	12
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.1
Tetrachloroethene	ND	ug/kg	6.1
Toluene	ND	ug/kg	6.1
Chlorobenzene	ND	ug/kg	6.1

Percent moisture is 19%. All results and limits are reported on a dry weight basis.

J = Result is detected below the reporting limit or is an estimated concentration.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

(cont.)

#9311301630

SB-1 (3.0' - 3.5')

Client Name: H+GCL

Client ID: SB-1 (3')

Lab ID: 031950-0007-SA

Matrix: SOIL

Sampled: 30 NOV 93

Received: 03 DEC 93

Authorized: 05 DEC 93

Prepared: NA

Analyzed: 09 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Ethylbenzene	ND	ug/kg	6.1
Styrene	ND	ug/kg	6.1
Xylenes (total)	ND	ug/kg	6.1
Surrogate	Recovery		
1,2-Dichloroethane-d4	101	%	
Toluene-d8	106	%	
4-Bromofluorobenzene	91	%	

Percent moisture is 19%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

#9311301710

SB-1 (4.5' - 5.0')

 Client Name: H+GCL
 Client ID: SB-1 (5')
 Lab ID: 031950-0008-SA
 Matrix: SOIL

 Sampled: 30 NOV 93
 Received: 03 DEC 93
 Authorized: 05 DEC 93

 Prepared: NA
 Analyzed: 11 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit	
Chloromethane	ND	ug/kg	61	d
tert-Butyl Methyl ether	ND	ug/kg	30	
Bromomethane	ND	ug/kg	61	
Vinyl Chloride	ND	ug/kg	61	
Chloroethane	ND	ug/kg	61	
Methylene chloride	ND	ug/kg	30	
Acetone	32	ug/kg	61	J
Carbon disulfide	ND	ug/kg	30	
1,1-Dichloroethene	ND	ug/kg	30	
1,1-Dichloroethane	ND	ug/kg	30	
1,2-Dichloroethene (cis/trans)	ND	ug/kg	30	
Chloroform	ND	ug/kg	30	
1,2-Dichloroethane	ND	ug/kg	30	
2-Butanone	ND	ug/kg	61	
1,1,1-Trichloroethane	ND	ug/kg	30	
Carbon tetrachloride	ND	ug/kg	30	
Vinyl Acetate	ND	ug/kg	61	
Bromodichloromethane	ND	ug/kg	30	
1,2-Dichloropropane	ND	ug/kg	30	
cis-1,3-Dichloropropene	ND	ug/kg	30	
Trichloroethene	ND	ug/kg	30	
Dibromochloromethane	ND	ug/kg	30	
1,1,2-Trichloroethane	ND	ug/kg	30	
Benzene	ND	ug/kg	30	
trans-1,3-Dichloropropene	ND	ug/kg	30	
Bromoform	ND	ug/kg	30	
4-Methyl-2-Pentanone	ND	ug/kg	61	
2-Hexanone	ND	ug/kg	61	
1,1,2,2-Tetrachloroethane	ND	ug/kg	30	
Tetrachloroethene	ND	ug/kg	30	
Toluene	ND	ug/kg	30	

Percent moisture is 18%. All results and limits are reported on a dry weight basis.

J = Result is detected below the reporting limit or is an estimated concentration.

d = All reporting limits raised due to matrix interferences.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

(cont.)

#9311301710

SB-1(4.5' to 5.0')

Client Name: H+GCL
Client ID: SB-1 (5')
Lab ID: 031950-0008-SA
Matrix: SOIL

Sampled: 30 NOV 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 11 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chlorobenzene	ND	ug/kg	30
Ethylbenzene	13	ug/kg	30
Styrene	ND	ug/kg	30
Xylenes (total)	ND	ug/kg	30
Surrogate	Recovery		
1,2-Dichloroethane-d4	99	%	
Toluene-d8	100	%	
4-Bromofluorobenzene	95	%	

Percent moisture is 18%. All results and limits are reported on a dry weight basis.

J = Result is detected below the reporting limit or is an estimated concentration.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics
Method 8240
9311301054
SB-2 (3')

Client Name: H+GCL
 Client ID: SB-2 (3')
 Lab ID: 031950-0001-SA
 Matrix: SOIL

Sampled: 30 NOV 93
 Received: 03 DEC 93
 Authorized: 05 DEC 93

Prepared: NA
 Analyzed: 09 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chloromethane	ND	ug/kg	12
tert-Butyl Methyl ether	ND	ug/kg	5.9
Bromomethane	ND	ug/kg	12
Vinyl Chloride	ND	ug/kg	12
Chloroethane	ND	ug/kg	12
Methylene chloride	ND	ug/kg	5.9
Acetone	ND	ug/kg	12
Carbon disulfide	ND	ug/kg	5.9
1,1-Dichloroethene	ND	ug/kg	5.9
1,1-Dichloroethane	ND	ug/kg	5.9
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	5.9
Chloroform	ND	ug/kg	5.9
1,2-Dichloroethane	ND	ug/kg	5.9
2-Butanone	ND	ug/kg	12
1,1,1-Trichloroethane	ND	ug/kg	5.9
Carbon tetrachloride	ND	ug/kg	5.9
Vinyl Acetate	ND	ug/kg	12
Bromodichloromethane	ND	ug/kg	5.9
1,2-Dichloropropane	ND	ug/kg	5.9
cis-1,3-Dichloropropene	ND	ug/kg	5.9
Trichloroethene	ND	ug/kg	5.9
Dibromochloromethane	ND	ug/kg	5.9
1,1,2-Trichloroethane	ND	ug/kg	5.9
Benzene	ND	ug/kg	5.9
trans-1,3-Dichloropropene	ND	ug/kg	5.9
Bromoform	ND	ug/kg	5.9
4-Methyl-2-Pentanone	ND	ug/kg	12
2-Hexanone	ND	ug/kg	12
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.9
Tetrachloroethene	ND	ug/kg	5.9
Toluene	ND	ug/kg	5.9
Chlorobenzene	ND	ug/kg	5.9
Ethylbenzene	ND	ug/kg	5.9

Percent moisture is 16%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
 ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile OrganicsMethod 8240
(cont.)

9311301054

SB-2 (3')

Client Name: H+GCL
Client ID: SB-2 (3')
Lab ID: 031950-0001-SA
Matrix: SOILSampled: 30 NOV 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	Units	Reporting Limit
Styrene	ND	ug/kg	5.9
Xylenes (total)	ND	ug/kg	5.9
Surrogate	Recovery		
1,2-Dichloroethane-d4	101	%	
Toluene-d8	106	%	
4-Bromofluorobenzene	90	%	

Percent moisture is 16%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

Client Name: H+GCL
Client ID: SB-2 (5')
Lab ID: 031950-0002-SA
Matrix: SOIL

#9311301144

SB-2 (4.9' - 5.2')

Sampled: 30 NOV 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Chloromethane	ND	ug/kg	12
tert-Butyl Methyl ether	ND	ug/kg	5.9
Bromomethane	ND	ug/kg	12
Vinyl Chloride	ND	ug/kg	12
Chloroethane	ND	ug/kg	12
Methylene chloride	ND	ug/kg	5.9
Acetone	ND	ug/kg	12
Carbon disulfide	ND	ug/kg	5.9
1,1-Dichloroethene	ND	ug/kg	5.9
1,1-Dichloroethane	ND	ug/kg	5.9
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.9
Chloroform	ND	ug/kg	5.9
1,2-Dichloroethane	ND	ug/kg	5.9
2-Butanone	ND	ug/kg	12
1,1,1-Trichloroethane	ND	ug/kg	5.9
Carbon tetrachloride	ND	ug/kg	5.9
Vinyl Acetate	ND	ug/kg	12
Bromodichloromethane	ND	ug/kg	5.9
1,2-Dichloropropane	ND	ug/kg	5.9
cis-1,3-Dichloropropene	ND	ug/kg	5.9
Trichloroethene	ND	ug/kg	5.9
Dibromochloromethane	ND	ug/kg	5.9
1,1,2-Trichloroethane	ND	ug/kg	5.9
Benzene	ND	ug/kg	5.9
trans-1,3-Dichloropropene	ND	ug/kg	5.9
Bromoform	ND	ug/kg	5.9
4-Methyl-2-Pentanone	ND	ug/kg	12
2-Hexanone	ND	ug/kg	12
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.9
Tetrachloroethene	ND	ug/kg	5.9
Toluene	ND	ug/kg	5.9
Chlorobenzene	ND	ug/kg	5.9
Ethylbenzene	ND	ug/kg	5.9

Percent moisture is 15%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile OrganicsMethod 8240
(cont.)

#9311301144

SB-2 (4.9' - 5.2')

Client Name: H+GCL
Client ID: SB-2 (5')
Lab ID: 031950-0002-SA
Matrix: SOILSampled: 30 NOV 93
Received: 03 DEC 93
Authorized: 05 DEC 93Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Styrene	ND	ug/kg	5.9
Xylenes (total)	ND	ug/kg	5.9
Surrogate	Recovery		
1,2-Dichloroethane-d4	101	%	
Toluene-d8	102	%	
4-Bromofluorobenzene	94	%	

Percent moisture is 15%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

#9311301355

SB-3 (3.0' to 3.5')

Client Name: H+GCL
Client ID: SB-3 (3')
Lab ID: 031950-0005-SA
Matrix: SOIL

Sampled: 30 NOV 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 10 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	12
tert-Butyl Methyl ether	ND	ug/kg	5.9
Bromomethane	ND	ug/kg	12
Vinyl Chloride	ND	ug/kg	12
Chloroethane	ND	ug/kg	12
Methylene chloride	ND	ug/kg	5.9
Acetone	ND	ug/kg	12
Carbon disulfide	ND	ug/kg	5.9
1,1-Dichloroethene	ND	ug/kg	5.9
1,1-Dichloroethane	ND	ug/kg	5.9
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.9
Chloroform	ND	ug/kg	5.9
1,2-Dichloroethane	ND	ug/kg	5.9
2-Butanone	ND	ug/kg	12
1,1,1-Trichloroethane	ND	ug/kg	5.9
Carbon tetrachloride	ND	ug/kg	5.9
Vinyl Acetate	ND	ug/kg	12
Bromodichloromethane	ND	ug/kg	5.9
1,2-Dichloropropane	ND	ug/kg	5.9
cis-1,3-Dichloropropene	ND	ug/kg	5.9
Trichloroethene	ND	ug/kg	5.9
Dibromochloromethane	ND	ug/kg	5.9
1,1,2-Trichloroethane	ND	ug/kg	5.9
Benzene	ND	ug/kg	5.9
trans-1,3-Dichloropropene	ND	ug/kg	5.9
Bromoform	ND	ug/kg	5.9
4-Methyl-2-Pentanone	ND	ug/kg	12
2-Hexanone	ND	ug/kg	12
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.9
Tetrachloroethene	ND	ug/kg	5.9
Toluene	ND	ug/kg	5.9
Chlorobenzene	ND	ug/kg	5.9
Ethylbenzene	ND	ug/kg	5.9

Percent moisture is 15%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

(cont.)

9311301355

SB-3 (3.0'-3.5')

Client Name: H+GCL
Client ID: SB-3 (3')
Lab ID: 031950-0005-SA
Matrix: SOIL

Sampled: 30 NOV 93
Received: 03 DEC 93
Authorized: 05 DEC 93

Prepared: NA
Analyzed: 10 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Styrene	ND	ug/kg	5.9
Xylenes (total)	ND	ug/kg	5.9
Surrogate	Recovery		
1,2-Dichloroethane-d4	102	%	
Toluene-d8	102	%	
4-Bromofluorobenzene	96	%	

Percent moisture is 15%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

#9311301505

SB-3(5.0 - 5.5')

Client Name: H+GCL
Client ID: SB-3 (5')
Lab ID: 031950-0006-SA
Matrix: SOIL

Sampled: 30 NOV 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	12
tert-Butyl Methyl ether	ND	ug/kg	5.8
Bromomethane	ND	ug/kg	12
Vinyl Chloride	ND	ug/kg	12
Chloroethane	ND	ug/kg	12
Methylene chloride	ND	ug/kg	5.8
Acetone	ND	ug/kg	12
Carbon disulfide	ND	ug/kg	5.8
1,1-Dichloroethene	ND	ug/kg	5.8
1,1-Dichloroethane	ND	ug/kg	5.8
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.8
Chloroform	ND	ug/kg	5.8
1,2-Dichloroethane	ND	ug/kg	5.8
2-Butanone	ND	ug/kg	12
1,1,1-Trichloroethane	ND	ug/kg	5.8
Carbon tetrachloride	ND	ug/kg	5.8
Vinyl Acetate	ND	ug/kg	12
Bromodichloromethane	ND	ug/kg	5.8
1,2-Dichloropropane	ND	ug/kg	5.8
cis-1,3-Dichloropropene	ND	ug/kg	5.8
Trichloroethene	ND	ug/kg	5.8
Dibromochloromethane	ND	ug/kg	5.8
1,1,2-Trichloroethane	ND	ug/kg	5.8
Benzene	ND	ug/kg	5.8
trans-1,3-Dichloropropene	ND	ug/kg	5.8
Bromoform	ND	ug/kg	5.8
4-Methyl-2-Pentanone	ND	ug/kg	12
2-Hexanone	ND	ug/kg	12
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.8
Tetrachloroethene	ND	ug/kg	5.8
Toluene	ND	ug/kg	5.8
Chlorobenzene	ND	ug/kg	5.8
Ethylbenzene	ND	ug/kg	5.8

Percent moisture is 14%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240
(cont.)

9311301505

SB-3(5.0'-5.5')

Client Name: H+GCL
Client ID: SB-3 (5')
Lab ID: 031950-0006-SA
Matrix: SOILSampled: 30 NOV 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Styrene	ND	ug/kg	5.8
Xylenes (total)	ND	ug/kg	5.8
Surrogate	Recovery		
1,2-Dichloroethane-d4	101	%	
Toluene-d8	100	%	
4-Bromofluorobenzene	96	%	

Percent moisture is 14%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

4312021045

SB-4 (2-5')

 Client Name: H+GCL
 Client ID: SB-4
 Lab ID: 031950-0012-SA
 Matrix: SOIL

 Sampled: 02 DEC 93
 Received: 03 DEC 93
 Authorized: 05 DEC 93

 Prepared: NA
 Analyzed: 09 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chloromethane	ND	ug/kg	13
tert-Butyl Methyl ether	ND	ug/kg	6.5
Bromomethane	ND	ug/kg	13
Vinyl Chloride	ND	ug/kg	13
Chloroethane	ND	ug/kg	13
Methylene chloride	ND	ug/kg	6.5
Acetone	ND	ug/kg	13
Carbon disulfide	ND	ug/kg	6.5
1,1-Dichloroethene	ND	ug/kg	6.5
1,1-Dichloroethane	ND	ug/kg	6.5
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	6.5
Chloroform	ND	ug/kg	6.5
1,2-Dichloroethane	ND	ug/kg	6.5
2-Butanone	ND	ug/kg	13
1,1,1-Trichloroethane	ND	ug/kg	6.5
Carbon tetrachloride	ND	ug/kg	6.5
Vinyl Acetate	ND	ug/kg	13
Bromodichloromethane	ND	ug/kg	6.5
1,2-Dichloropropane	ND	ug/kg	6.5
cis-1,3-Dichloropropene	ND	ug/kg	6.5
Trichloroethene	ND	ug/kg	6.5
Dibromochloromethane	ND	ug/kg	6.5
1,1,2-Trichloroethane	ND	ug/kg	6.5
Benzene	ND	ug/kg	6.5
trans-1,3-Dichloropropene	ND	ug/kg	6.5
Bromoform	ND	ug/kg	6.5
4-Methyl-2-Pentanone	ND	ug/kg	13
2-Hexanone	ND	ug/kg	13
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.5
Tetrachloroethene	ND	ug/kg	6.5
Toluene	ND	ug/kg	6.5
Chlorobenzene	ND	ug/kg	6.5
Ethylbenzene	ND	ug/kg	6.5

Percent moisture is 23%. All results and limits are reported on a dry weight basis.

 NA = Not Applicable
 ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240
(cont.)

#9312021045

SB-4(2.5')

Client Name: H+GCL
Client ID: SB-4
Lab ID: 031950-0012-SA
Matrix: SOILSampled: 02 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Styrene	ND	ug/kg	6.5
Xylenes (total)	ND	ug/kg	6.5
Surrogate	Recovery		
1,2-Dichloroethane-d4	98	%	
Toluene-d8	102	%	
4-Bromofluorobenzene	96	%	

Percent moisture is 23%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

#9312021050

SB-4(3.8')

Client Name: H+GCL
Client ID: SB-4
Lab ID: 031950-0013-SA
Matrix: SOIL

Sampled: 02 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93

Prepared: NA
Analyzed: 10 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chloromethane	ND	ug/kg	13
tert-Butyl Methyl ether	ND	ug/kg	6.6
Bromomethane	ND	ug/kg	13
Vinyl Chloride	ND	ug/kg	13
Chloroethane	ND	ug/kg	13
Methylene chloride	ND	ug/kg	6.6
Acetone	ND	ug/kg	13
Carbon disulfide	ND	ug/kg	6.6
1,1-Dichloroethene	ND	ug/kg	6.6
1,1-Dichloroethane	ND	ug/kg	6.6
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.6
Chloroform	ND	ug/kg	6.6
1,2-Dichloroethane	ND	ug/kg	6.6
2-Butanone	ND	ug/kg	13
1,1,1-Trichloroethane	ND	ug/kg	6.6
Carbon tetrachloride	ND	ug/kg	6.6
Vinyl Acetate	ND	ug/kg	13
Bromodichloromethane	ND	ug/kg	6.6
1,2-Dichloropropane	ND	ug/kg	6.6
cis-1,3-Dichloropropene	ND	ug/kg	6.6
Trichloroethene	ND	ug/kg	6.6
Dibromochloromethane	ND	ug/kg	6.6
1,1,2-Trichloroethane	ND	ug/kg	6.6
Benzene	ND	ug/kg	6.6
trans-1,3-Dichloropropene	ND	ug/kg	6.6
Bromoform	ND	ug/kg	6.6
4-Methyl-2-Pentanone	ND	ug/kg	13
2-Hexanone	ND	ug/kg	13
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.6
Tetrachloroethene	ND	ug/kg	6.6
Toluene	ND	ug/kg	6.6
Chlorobenzene	ND	ug/kg	6.6
Ethylbenzene	ND	ug/kg	6.6

Percent moisture is 24%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile OrganicsMethod 8240
(cont.)

#9312021050

SB-4 (3.8')

Client Name: H+GCL
Client ID: SB-4
Lab ID: 031950-0013-SA
Matrix: SOILSampled: 02 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 10 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Styrene	ND	ug/kg	6.6
Xylenes (total)	ND	ug/kg	6.6
Surrogate	Recovery		
1,2-Dichloroethane-d4	98	%	
Toluene-d8	108	%	
4-Bromofluorobenzene	89	%	

Percent moisture is 24%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

Client Name: H+GCL
Client ID: SB-5 9312041320
Lab ID: 032021-0007-SA
Matrix: SOIL

(2.0' - 2.5')

Sampled: 04 DEC 93
Received: 07 DEC 93
Authorized: 08 DEC 93
Prepared: NA
Analyzed: 14 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	12
tert-Butyl Methyl ether	ND	ug/kg	6.2
Bromomethane	ND	ug/kg	12
Vinyl Chloride	ND	ug/kg	12
Chloroethane	ND	ug/kg	12
Methylene chloride	ND	ug/kg	6.2
Acetone	ND	ug/kg	12
Carbon disulfide	ND	ug/kg	6.2
1,1-Dichloroethene	ND	ug/kg	6.2
1,1-Dichloroethane	ND	ug/kg	6.2
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.2
Chloroform	ND	ug/kg	6.2
1,2-Dichloroethane	ND	ug/kg	6.2
2-Butanone	ND	ug/kg	12
1,1,1-Trichloroethane	ND	ug/kg	6.2
Carbon tetrachloride	ND	ug/kg	6.2
Vinyl Acetate	ND	ug/kg	12
Bromodichloromethane	ND	ug/kg	6.2
1,2-Dichloropropane	ND	ug/kg	6.2
cis-1,3-Dichloropropene	ND	ug/kg	6.2
Trichloroethene	ND	ug/kg	6.2
Dibromochloromethane	ND	ug/kg	6.2
1,1,2-Trichloroethane	ND	ug/kg	6.2
Benzene	ND	ug/kg	6.2
trans-1,3-Dichloropropene	ND	ug/kg	6.2
Bromoform	ND	ug/kg	6.2
4-Methyl-2-Pentanone	ND	ug/kg	12
2-Hexanone	ND	ug/kg	12
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.2
Tetrachloroethene	ND	ug/kg	6.2
Toluene	ND	ug/kg	6.2
Chlorobenzene	ND	ug/kg	6.2
Ethylbenzene	ND	ug/kg	6.2

Percent moisture is 19%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile Organics**Method 8240**
(cont.)

(2.0'-2.5')

Client Name: H+GCL
Client ID: SB-5 9312041320
Lab ID: 032021-0007-SA
Matrix: SOILSampled: 04 DEC 93
Received: 07 DEC 93
Authorized: 08 DEC 93Prepared: NA
Analyzed: 14 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Styrene	ND	ug/kg	6.2
Xylenes (total)	ND	ug/kg	6.2
Surrogate	Recovery		
1,2-Dichloroethane-d4	100	%	
Toluene-d8	103	%	
4-Bromofluorobenzene	96	%	

Percent moisture is 19%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile Organics
Method 8240

Client Name: H+GCL
 Client ID: SB-6 9312041550
 Lab ID: 032021-0008-SA
 Matrix: SOIL

(24)
 Sampled: 04 DEC 93
 Received: 07 DEC 93
 Authorized: 08 DEC 93
 Prepared: NA
 Analyzed: 14 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chloromethane	ND	ug/kg	13
tert-Butyl Methyl ether	ND	ug/kg	6.6
Bromomethane	ND	ug/kg	13
Vinyl Chloride	ND	ug/kg	13
Chloroethane	ND	ug/kg	13
Methylene chloride	ND	ug/kg	6.6
Acetone	ND	ug/kg	13
Carbon disulfide	ND	ug/kg	6.6
1,1-Dichloroethene	ND	ug/kg	6.6
1,1-Dichloroethane	ND	ug/kg	6.6
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.6
Chloroform	ND	ug/kg	6.6
1,2-Dichloroethane	ND	ug/kg	6.6
2-Butanone	ND	ug/kg	13
1,1,1-Trichloroethane	ND	ug/kg	6.6
Carbon tetrachloride	ND	ug/kg	6.6
Vinyl Acetate	ND	ug/kg	13
Bromodichloromethane	ND	ug/kg	6.6
1,2-Dichloropropane	ND	ug/kg	6.6
cis-1,3-Dichloropropene	ND	ug/kg	6.6
Trichloroethene	ND	ug/kg	6.6
Dibromochloromethane	ND	ug/kg	6.6
1,1,2-Trichloroethane	ND	ug/kg	6.6
Benzene	ND	ug/kg	6.6
trans-1,3-Dichloropropene	ND	ug/kg	6.6
Bromoform	ND	ug/kg	6.6
4-Methyl-2-Pentanone	ND	ug/kg	13
2-Hexanone	ND	ug/kg	13
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.6
Tetrachloroethene	ND	ug/kg	6.6
Toluene	ND	ug/kg	6.6
Chlorobenzene	ND	ug/kg	6.6
Ethylbenzene	ND	ug/kg	6.6

Percent moisture is 25%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
 ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile OrganicsMethod 8240
(cont.)Client Name: H+GCL
Client ID: SB-6 9312041550
Lab ID: 032021-0008-SA
Matrix: SOIL(24)
Sampled: 04 DEC 93
Received: 07 DEC 93
Authorized: 08 DEC 93
Prepared: NA
Analyzed: 14 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Styrene	ND	ug/kg	6.6
Xylenes (total)	ND	ug/kg	6.6
Surrogate	Recovery		
1,2-Dichloroethane-d4	98	%	
Toluene-d8	107	%	
4-Bromofluorobenzene	90	%	

Percent moisture is 25%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile Organics
Method 8240

Client Name: H+GCL
 Client ID: SB-6 9312041555
 Lab ID: 032021-0009-SA
 Matrix: SOIL

(3.81)
 Sampled: 04 DEC 93
 Received: 07 DEC 93
 Authorized: 08 DEC 93
 Prepared: NA
 Analyzed: 15 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Chloromethane	ND	ug/kg	13
tert-Butyl Methyl ether	ND	ug/kg	6.5
Bromomethane	ND	ug/kg	13
Vinyl Chloride	ND	ug/kg	13
Chloroethane	ND	ug/kg	13
Methylene chloride	ND	ug/kg	6.5
Acetone	180	ug/kg	13
Carbon disulfide	ND	ug/kg	6.5
1,1-Dichloroethene	ND	ug/kg	6.5
1,1-Dichloroethane	ND	ug/kg	6.5
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.5
Chloroform	ND	ug/kg	6.5
1,2-Dichloroethane	ND	ug/kg	6.5
2-Butanone	34	ug/kg	13
1,1,1-Trichloroethane	ND	ug/kg	6.5
Carbon tetrachloride	ND	ug/kg	6.5
Vinyl Acetate	ND	ug/kg	13
Bromodichloromethane	ND	ug/kg	6.5
1,2-Dichloropropane	ND	ug/kg	6.5
cis-1,3-Dichloropropene	ND	ug/kg	6.5
Trichloroethene	ND	ug/kg	6.5
Dibromochloromethane	ND	ug/kg	6.5
1,1,2-Trichloroethane	ND	ug/kg	6.5
Benzene	ND	ug/kg	6.5
trans-1,3-Dichloropropene	ND	ug/kg	6.5
Bromoform	ND	ug/kg	6.5
4-Methyl-2-Pentanone	ND	ug/kg	13
2-Hexanone	ND	ug/kg	13
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.5
Tetrachloroethene	ND	ug/kg	6.5
Toluene	ND	ug/kg	6.5
Chlorobenzene	ND	ug/kg	6.5
Ethylbenzene	41	ug/kg	6.5

Percent moisture is 24%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
 ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile Organics

Method 8240

(cont.)

 Client Name: H+GCL
 Client ID: SB-6 9312041555
 Lab ID: 032021-0009-SA
 Matrix: SOIL

 (3.81)
 Sampled: 04 DEC 93
 Received: 07 DEC 93
 Authorized: 08 DEC 93
 Prepared: NA
 Analyzed: 15 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Styrene	ND	ug/kg	6.5
Xylenes (total)	ND	ug/kg	6.5
Surrogate	Recovery		
1,2-Dichloroethane-d4	104	%	
Toluene-d8	109	%	
4-Bromofluorobenzene	93	%	

Percent moisture is 24%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

WASTE MANAGEMENT UNITS

TCL Volatile Organics

Method 8240

INFILT. GALLERY
IG/SB-1 (S.O.)
BGL

Client Name: H+GCL
Client ID: IG/SB-1
Lab ID: 031950-0017-SA
Matrix: SOIL

Sampled: 01 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93

Prepared: NA
Analyzed: 10 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Chloromethane	ND	ug/kg	12
tert-Butyl Methyl ether	ND	ug/kg	6.0
Bromomethane	ND	ug/kg	12
Vinyl Chloride	ND	ug/kg	12
Chloroethane	ND	ug/kg	12
Methylene chloride	ND	ug/kg	6.0
Acetone	2.9	ug/kg	12
Carbon disulfide	ND	ug/kg	6.0
1,1-Dichloroethene	ND	ug/kg	6.0
1,1-Dichloroethane	ND	ug/kg	6.0
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.0
Chloroform	ND	ug/kg	6.0
1,2-Dichloroethane	ND	ug/kg	6.0
2-Butanone	ND	ug/kg	12
1,1,1-Trichloroethane	ND	ug/kg	6.0
Carbon tetrachloride	ND	ug/kg	6.0
Vinyl Acetate	ND	ug/kg	12
Bromodichloromethane	ND	ug/kg	6.0
1,2-Dichloropropane	ND	ug/kg	6.0
cis-1,3-Dichloropropene	ND	ug/kg	6.0
Trichloroethene	ND	ug/kg	6.0
Dibromochloromethane	ND	ug/kg	6.0
1,1,2-Trichloroethane	ND	ug/kg	6.0
Benzene	ND	ug/kg	6.0
trans-1,3-Dichloropropene	ND	ug/kg	6.0
Bromoform	ND	ug/kg	6.0
4-Methyl-2-Pentanone	ND	ug/kg	12
2-Hexanone	ND	ug/kg	12
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.0
Tetrachloroethene	ND	ug/kg	6.0
Toluene	ND	ug/kg	6.0
Chlorobenzene	ND	ug/kg	6.0

Percent moisture is 17%. All results and limits are reported on a dry weight basis.

J = Result is detected below the reporting limit or is an estimated concentration.
NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240
(cont.)

Client Name: H+GCL
Client ID: IG/SB-1
Lab ID: 031950-0017-SA
Matrix: SOIL

9312011800

IG/SB-1 (5.0')
BGL

Sampled: 01 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 10 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Ethylbenzene	ND	ug/kg	6.0
Styrene	ND	ug/kg	6.0
Xylenes (total)	ND	ug/kg	6.0
Surrogate	Recovery		
1,2-Dichloroethane-d4	99	%	
Toluene-d8	104	%	
4-Bromofluorobenzene	91	%	

Percent moisture is 17%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Client Name: H+GCL
 Client ID: IG/SB-2
 Lab ID: 031950-0014-SA
 Matrix: SOIL

Method 8240

 #93120212³⁵~~45~~

 INFILT. TANK
 Bottom (0.8' to 1.3')

Sampled: 02 DEC 93
 Received: 03 DEC 93
 Authorized: 05 DEC 93

Prepared: NA
 Analyzed: 10 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit	
Chloromethane	ND	ug/kg	13	
tert-Butyl Methyl ether	ND	ug/kg	6.4	
Bromomethane	ND	ug/kg	13	
Vinyl Chloride	ND	ug/kg	13	
Chloroethane	ND	ug/kg	13	
Methylene chloride	ND	ug/kg	6.4	
Acetone	5.6	ug/kg	13	J
Carbon disulfide	ND	ug/kg	6.4	
1,1-Dichloroethene	ND	ug/kg	6.4	
1,1-Dichloroethane	ND	ug/kg	6.4	
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.4	
Chloroform	ND	ug/kg	6.4	
1,2-Dichloroethane	ND	ug/kg	6.4	
2-Butanone	ND	ug/kg	13	
1,1,1-Trichloroethane	ND	ug/kg	6.4	
Carbon tetrachloride	ND	ug/kg	6.4	
Vinyl Acetate	ND	ug/kg	13	
Bromodichloromethane	ND	ug/kg	6.4	
1,2-Dichloropropane	ND	ug/kg	6.4	
cis-1,3-Dichloropropene	ND	ug/kg	6.4	
Trichloroethene	ND	ug/kg	6.4	
Dibromochloromethane	ND	ug/kg	6.4	
1,1,2-Trichloroethane	ND	ug/kg	6.4	
Benzene	ND	ug/kg	6.4	
trans-1,3-Dichloropropene	ND	ug/kg	6.4	
Bromoform	ND	ug/kg	6.4	
4-Methyl-2-Pentanone	ND	ug/kg	13	
2-Hexanone	ND	ug/kg	13	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.4	
Tetrachloroethene	ND	ug/kg	6.4	
Toluene	ND	ug/kg	6.4	
Chlorobenzene	ND	ug/kg	6.4	

Percent moisture is 22%. All results and limits are reported on a dry weight basis.

J = Result is detected below the reporting limit or is an estimated concentration.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Client Name: H+GCL
 Client ID: IG/SB-2
 Lab ID: 031950-0014-SA
 Matrix: SOIL

Method 8240

(cont.)

#93120212³⁵~~45~~

INFILT. TANK
BOTTOM (0.8' to 1.5')

Sampled: 02 DEC 93
 Received: 03 DEC 93
 Authorized: 05 DEC 93

Prepared: NA
 Analyzed: 10 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Ethylbenzene	ND	ug/kg	6.4
Styrene	ND	ug/kg	6.4
Xylenes (total)	ND	ug/kg	6.4
Surrogate	Recovery		
1,2-Dichloroethane-d4	99	%	
Toluene-d8	102	%	
4-Bromofluorobenzene	91	%	

Percent moisture is 22%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

 Client Name: H+GCL
 Client ID: OW/SB-1 9312041000
 Lab ID: 032021-0004-SA
 Matrix: SOIL

(9.5')

 Sampled: 04 DEC 93
 Received: 07 DEC 93
 Authorized: 08 DEC 93
 Prepared: NA
 Analyzed: 14 DEC 93

Parameter	Result	Units	Reporting Limit	
Chloromethane	ND	ug/kg	12	
tert-Butyl Methyl ether	ND	ug/kg	6.2	
Bromomethane	ND	ug/kg	12	
Vinyl Chloride	ND	ug/kg	12	
Chloroethane	ND	ug/kg	12	
Methylene chloride	ND	ug/kg	6.2	
Acetone	40	ug/kg	12	B
Carbon disulfide	ND	ug/kg	6.2	
1,1-Dichloroethene	ND	ug/kg	6.2	
1,1-Dichloroethane	ND	ug/kg	6.2	
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.2	
Chloroform	ND	ug/kg	6.2	
1,2-Dichloroethane	ND	ug/kg	6.2	
2-Butanone	ND	ug/kg	12	
1,1,1-Trichloroethane	ND	ug/kg	6.2	
Carbon tetrachloride	ND	ug/kg	6.2	
Vinyl Acetate	ND	ug/kg	12	
Bromodichloromethane	ND	ug/kg	6.2	
1,2-Dichloropropane	ND	ug/kg	6.2	
cis-1,3-Dichloropropene	ND	ug/kg	6.2	
Trichloroethene	ND	ug/kg	6.2	
Dibromochloromethane	ND	ug/kg	6.2	
1,1,2-Trichloroethane	ND	ug/kg	6.2	
Benzene	ND	ug/kg	6.2	
trans-1,3-Dichloropropene	ND	ug/kg	6.2	
Bromoform	ND	ug/kg	6.2	
4-Methyl-2-Pentanone	ND	ug/kg	12	
2-Hexanone	ND	ug/kg	12	
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.2	
Tetrachloroethene	ND	ug/kg	6.2	
Toluene	ND	ug/kg	6.2	
Chlorobenzene	ND	ug/kg	6.2	

Percent moisture is 19%. All results and limits are reported on a dry weight basis.

B = Compound is also detected in the blank.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile Organics
Method 8240
 (cont.)

 Client Name: H+GCL
 Client ID: OW/SB-1 9312041000
 Lab ID: 032021-0004-SA
 Matrix: SOIL

 (9.5')
 Sampled: 04 DEC 93
 Received: 07 DEC 93
 Authorized: 08 DEC 93
 Prepared: NA
 Analyzed: 14 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Ethylbenzene	67	ug/kg	6.2
Styrene	ND	ug/kg	6.2
Xylenes (total)	ND	ug/kg	6.2
Surrogate	Recovery		
1,2-Dichloroethane-d4	101	%	
Toluene-d8	102	%	
4-Bromofluorobenzene	93	%	

Percent moisture is 19%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
 ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile Organics

Method 8240

ST/SB-1 (5.0' to 5.5')

Client Name: H+GCL
Client ID: ST/SB-1
Lab ID: 031950-0016-SA
Matrix: SOIL

Sampled: 01 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 10 DEC 93

#9312011400

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chloromethane	ND	ug/kg	12
tert-Butyl Methyl ether	ND	ug/kg	6.1
Bromomethane	ND	ug/kg	12
Vinyl Chloride	ND	ug/kg	12
Chloroethane	ND	ug/kg	12
Methylene chloride	ND	ug/kg	6.1
Acetone	3.4	ug/kg	12
Carbon disulfide	ND	ug/kg	6.1
1,1-Dichloroethene	ND	ug/kg	6.1
1,1-Dichloroethane	ND	ug/kg	6.1
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	6.1
Chloroform	ND	ug/kg	6.1
1,2-Dichloroethane	ND	ug/kg	6.1
2-Butanone	ND	ug/kg	12
1,1,1-Trichloroethane	ND	ug/kg	6.1
Carbon tetrachloride	ND	ug/kg	6.1
Vinyl Acetate	ND	ug/kg	12
Bromodichloromethane	ND	ug/kg	6.1
1,2-Dichloropropane	ND	ug/kg	6.1
cis-1,3-Dichloropropene	ND	ug/kg	6.1
Trichloroethene	ND	ug/kg	6.1
Dibromochloromethane	ND	ug/kg	6.1
1,1,2-Trichloroethane	ND	ug/kg	6.1
Benzene	ND	ug/kg	6.1
trans-1,3-Dichloropropene	ND	ug/kg	6.1
Bromoform	ND	ug/kg	6.1
4-Methyl-2-Pentanone	ND	ug/kg	12
2-Hexanone	ND	ug/kg	12
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.1
Tetrachloroethene	ND	ug/kg	6.1
Toluene	ND	ug/kg	6.1
Chlorobenzene	ND	ug/kg	6.1

Percent moisture is 17%. All results and limits are reported on a dry weight basis.

J = Result is detected below the reporting limit or is an estimated concentration.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

ST/SB-1 (5.0 to 5.5)

Method 8240
(cont.)

#931201400

Client Name: H+GCL
Client ID: ST/SB-1
Lab ID: 031950-0016-SA
Matrix: SOILSampled: 01 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 10 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Ethylbenzene	ND	ug/kg	6.1
Styrene	ND	ug/kg	6.1
Xylenes (total)	ND	ug/kg	6.1
Surrogate	Recovery		
1,2-Dichloroethane-d4	99	%	
Toluene-d8	105	%	
4-Bromofluorobenzene	89	%	

Percent moisture is 17%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

MONITOR WELL BORINGS



TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: 9312080930
 Lab ID: 032087-0010-SA
 Matrix: SOIL

TT-1 (5.0'-5.5')
 Sampled: 08 DEC 93
 Received: 09 DEC 93
 Authorized: 12 DEC 93

Prepared: NA
 Analyzed: 15 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chloromethane	ND	ug/kg	10
tert-Butyl Methyl ether	180	ug/kg	11
Bromomethane	ND	ug/kg	10
Vinyl Chloride	ND	ug/kg	10
Chloroethane	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
Acetone	53	ug/kg	11
Carbon disulfide	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	5.0
Chloroform	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
2-Butanone	ND	ug/kg	10
1,1,1-Trichloroethane	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Vinyl Acetate	ND	ug/kg	10
Bromodichloromethane	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Dibromochloromethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Benzene	8.2	ug/kg	5.5
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
4-Methyl-2-Pentanone	ND	ug/kg	10
2-Hexanone	ND	ug/kg	10
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0

D

Percent moisture is 9.8%. All results and limits are reported on a dry weight basis.

D = Compound quantitated using a secondary dilution.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

(cont.)

TT-1 (50'-55')

Client Name: H+GCL
Client ID: 9312080930
Lab ID: 032087-0010-SA
Matrix: SOIL

Sampled: 08 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93
Prepared: NA
Analyzed: 15 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Ethylbenzene	21	ug/kg	5.5
Styrene	ND	ug/kg	5.0
Xylenes (total)	2.5	ug/kg	5.5 J
Surrogate	Recovery		
1,2-Dichloroethane-d4	105	%	
Toluene-d8	105	%	
4-Bromofluorobenzene	96	%	

Percent moisture is 9.8%. All results and limits are reported on a dry weight basis.

J = Result is detected below the reporting limit or is an estimated concentration.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: 9312080935
 Lab ID: 032087-0011-SA
 Matrix: SOIL

Sampled: 08 DEC 93
 Received: 09 DEC 93
 Authorized: 12 DEC 93

Prepared: NA
 Analyzed: 16 DEC 93

TT-1 (5.0' - 5.5') Duplicate

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	10
tert-Butyl Methyl ether	170	ug/kg	5.6
Bromomethane	ND	ug/kg	10
Vinyl Chloride	ND	ug/kg	10
Chloroethane	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
Acetone	48	ug/kg	11
Carbon disulfide	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.0
Chloroform	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
2-Butanone	ND	ug/kg	10
1,1,1-Trichloroethane	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Vinyl Acetate	ND	ug/kg	10
Bromodichloromethane	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Dibromochloromethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Benzene	5.0	ug/kg	5.6
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
4-Methyl-2-Pentanone	ND	ug/kg	10
2-Hexanone	ND	ug/kg	10
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0

J

Percent moisture is 11%. All results and limits are reported on a dry weight basis.

J = Result is detected below the reporting limit or is an estimated concentration.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240
(cont.)

Client Name: H+GCL
Client ID: 9312080935
Lab ID: 032087-0011-SA
Matrix: SOIL

TT-1 (50'-55') Duplicate
Sampled: 08 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93
Prepared: NA
Analyzed: 16 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit	
Ethylbenzene	18	ug/kg	5.6	
Styrene	ND	ug/kg	5.0	
Xylenes (total)	2.5	ug/kg	5.6	J
Surrogate	Recovery			
1,2-Dichloroethane-d4	108	%		
Toluene-d8	103	%		
4-Bromofluorobenzene	102	%		

Percent moisture is 11%. All results and limits are reported on a dry weight basis.

J = Result is detected below the reporting limit or is an estimated concentration.
NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: 9312080940
 Lab ID: 032087-0012-SA
 Matrix: SOIL

TT-1 (10.0'-10.5')
 Sampled: 08 DEC 93
 Received: 09 DEC 93
 Authorized: 12 DEC 93
 Prepared: NA
 Analyzed: 16 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Chloromethane	ND	ug/kg	10
tert-Butyl Methyl ether	68	ug/kg	5.4
Bromomethane	ND	ug/kg	10
Vinyl Chloride	ND	ug/kg	10
Chloroethane	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
Acetone	23	ug/kg	11
Carbon disulfide	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	5.0
Chloroform	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
2-Butanone	ND	ug/kg	10
1,1,1-Trichloroethane	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Vinyl Acetate	ND	ug/kg	10
Bromodichloromethane	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Dibromochloromethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Benzene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
4-Methyl-2-Pentanone	ND	ug/kg	10
2-Hexanone	ND	ug/kg	10
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0

Percent moisture is 7.4%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
 ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

(cont.)

TT-1 (10.0' - 10.5')

Client Name: H+GCL
Client ID: 9312080940
Lab ID: 032087-0012-SA
Matrix: SOIL

Sampled: 08 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93
Prepared: NA
Analyzed: 16 DEC 93

Parameter	Result	Units	Reporting Limit
Styrene	ND	ug/kg	5.0
Xylenes (total)	ND	ug/kg	5.0
Surrogate	Recovery		
1,2-Dichloroethane-d4	108	%	
Toluene-d8	105	%	
4-Bromofluorobenzene	99	%	

Percent moisture is 7.4%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: 9312071030
 Lab ID: 032087-0004-SA
 Matrix: SOIL

TT-1d (4.5'-50')
 Sampled: 07 DEC 93
 Received: 09 DEC 93
 Authorized: 12 DEC 93

Prepared: NA
 Analyzed: 15 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit	
Chloromethane	ND	ug/kg	10	
tert-Butyl Methyl ether	610	ug/kg	29	D
Bromomethane	ND	ug/kg	10	
Vinyl Chloride	ND	ug/kg	10	
Chloroethane	ND	ug/kg	10	
Methylene chloride	ND	ug/kg	5.0	
Acetone	120	ug/kg	12	
Carbon disulfide	ND	ug/kg	5.0	
1,1-Dichloroethene	ND	ug/kg	5.0	
1,1-Dichloroethane	ND	ug/kg	5.0	
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	5.0	
Chloroform	ND	ug/kg	5.0	
1,2-Dichloroethane	ND	ug/kg	5.0	
2-Butanone	7.6	ug/kg	12	J
1,1,1-Trichloroethane	ND	ug/kg	5.0	
Carbon tetrachloride	ND	ug/kg	5.0	
Vinyl Acetate	ND	ug/kg	10	
Bromodichloromethane	ND	ug/kg	5.0	
1,2-Dichloropropane	ND	ug/kg	5.0	
cis-1,3-Dichloropropene	ND	ug/kg	5.0	
Trichloroethene	ND	ug/kg	5.0	
Dibromochloromethane	ND	ug/kg	5.0	
1,1,2-Trichloroethane	ND	ug/kg	5.0	
Benzene	66	ug/kg	5.8	
trans-1,3-Dichloropropene	ND	ug/kg	5.0	
Bromoform	ND	ug/kg	5.0	
4-Methyl-2-Pentanone	ND	ug/kg	10	
2-Hexanone	ND	ug/kg	10	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0	
Tetrachloroethene	ND	ug/kg	5.0	
Toluene	ND	ug/kg	5.0	

Percent moisture is 14%. All results and limits are reported on a dry weight basis.

D = Compound quantitated using a secondary dilution.

J = Result is detected below the reporting limit or is an estimated concentration.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240
(cont.)Client Name: H+GCL
Client ID: 9312071030
Lab ID: 032087-0004-SA
Matrix: SOIL

TT-1d (4.5-9.0')

Sampled: 07 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93
Prepared: NA
Analyzed: 15 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chlorobenzene	ND	ug/kg	5.0
Ethylbenzene	110	ug/kg	5.8
Styrene	ND	ug/kg	5.0
Xylenes (total)	10	ug/kg	5.8
Surrogate	Recovery		
1,2-Dichloroethane-d4	110	%	
Toluene-d8	103	%	
4-Bromofluorobenzene	97	%	

Percent moisture is 14%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: 9312071033
 Lab ID: 032087-0005-SA
 Matrix: SOIL

TT-1d (45'-50') Duplicate

Sampled: 07 DEC 93
 Received: 09 DEC 93
 Authorized: 12 DEC 93
 Prepared: NA
 Analyzed: 15 DEC 93

Parameter	Result	Units	Reporting Limit	
Chloromethane	ND	ug/kg	10	
tert-Butyl Methyl ether	460	ug/kg	33	D
Bromomethane	ND	ug/kg	10	
Vinyl Chloride	ND	ug/kg	10	
Chloroethane	ND	ug/kg	10	
Methylene chloride	ND	ug/kg	5.0	
Acetone	90	ug/kg	13	
Carbon disulfide	ND	ug/kg	5.0	
1,1-Dichloroethene	ND	ug/kg	5.0	
1,1-Dichloroethane	ND	ug/kg	5.0	
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.0	
Chloroform	ND	ug/kg	5.0	
1,2-Dichloroethane	ND	ug/kg	5.0	
2-Butanone	6.9	ug/kg	13	J
1,1,1-Trichloroethane	ND	ug/kg	5.0	
Carbon tetrachloride	ND	ug/kg	5.0	
Vinyl Acetate	ND	ug/kg	10	
Bromodichloromethane	ND	ug/kg	5.0	
1,2-Dichloropropane	ND	ug/kg	5.0	
cis-1,3-Dichloropropene	ND	ug/kg	5.0	
Trichloroethene	ND	ug/kg	5.0	
Dibromochloromethane	ND	ug/kg	5.0	
1,1,2-Trichloroethane	ND	ug/kg	5.0	
Benzene	69	ug/kg	6.6	
trans-1,3-Dichloropropene	ND	ug/kg	5.0	
Bromoform	ND	ug/kg	5.0	
4-Methyl-2-Pentanone	ND	ug/kg	10	
2-Hexanone	ND	ug/kg	10	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0	
Tetrachloroethene	ND	ug/kg	5.0	
Toluene	ND	ug/kg	5.0	

Percent moisture is 24%. All results and limits are reported on a dry weight basis.

D = Compound quantitated using a secondary dilution.

J = Result is detected below the reporting limit or is an estimated concentration.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240
(cont.)Client Name: H+GCL
Client ID: 9312071033
Lab ID: 032087-0005-SA
Matrix: SOILTT-1cl (4.51-5.01) Duplicate
Sampled: 07 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93
Prepared: NA
Analyzed: 15 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chlorobenzene	ND	ug/kg	5.0
Ethylbenzene	140	ug/kg	6.6
Styrene	ND	ug/kg	5.0
Xylenes (total)	13	ug/kg	6.6
Surrogate	Recovery		
1,2-Dichloroethane-d4	110	%	
Toluene-d8	103	%	
4-Bromofluorobenzene	100	%	

Percent moisture is 24%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: 9312071140
 Lab ID: 032087-0008-SA
 Matrix: SOIL

TT-1d (10.0' - 10.3')

Sampled: 07 DEC 93
 Received: 09 DEC 93
 Authorized: 12 DEC 93
 Prepared: NA
 Analyzed: 15 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Chloromethane	ND	ug/kg	10
tert-Butyl Methyl ether	160	ug/kg	5.4
Bromomethane	ND	ug/kg	10
Vinyl Chloride	ND	ug/kg	10
Chloroethane	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
Acetone	37	ug/kg	11
Carbon disulfide	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.0
Chloroform	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
2-Butanone	ND	ug/kg	10
1,1,1-Trichloroethane	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Vinyl Acetate	ND	ug/kg	10
Bromodichloromethane	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Dibromochloromethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Benzene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
4-Methyl-2-Pentanone	ND	ug/kg	10
2-Hexanone	ND	ug/kg	10
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0

Percent moisture is 7.8%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
 ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240
(cont.)Client Name: H+GCL
Client ID: 9312071140
Lab ID: 032087-0008-SA
Matrix: SOIL

TT-1 d (10.0' - 10.3')

Sampled: 07 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93
Prepared: NA
Analyzed: 15 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Styrene	ND	ug/kg	5.0
Xylenes (total)	ND	ug/kg	5.0
Surrogate	Recovery		
1,2-Dichloroethane-d4	105	%	
Toluene-d8	100	%	
4-Bromofluorobenzene	100	%	

Percent moisture is 7.8%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani

TCL Volatile Organics

Method 8240

Client Name: H+GCL
Client ID: TT-2 9312041100
Lab ID: 032021-0005-SA
Matrix: SOIL

(2.5')

Sampled: 04 DEC 93
Received: 07 DEC 93
Authorized: 08 DEC 93

Prepared: NA
Analyzed: 14 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chloromethane	ND	ug/kg	12
tert-Butyl Methyl ether	ND	ug/kg	6.1
Bromomethane	ND	ug/kg	12
Vinyl Chloride	ND	ug/kg	12
Chloroethane	ND	ug/kg	12
Methylene chloride	ND	ug/kg	6.1
Acetone	ND	ug/kg	12
Carbon disulfide	ND	ug/kg	6.1
1,1-Dichloroethene	ND	ug/kg	6.1
1,1-Dichloroethane	ND	ug/kg	6.1
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	6.1
Chloroform	ND	ug/kg	6.1
1,2-Dichloroethane	ND	ug/kg	6.1
2-Butanone	ND	ug/kg	12
1,1,1-Trichloroethane	ND	ug/kg	6.1
Carbon tetrachloride	ND	ug/kg	6.1
Vinyl Acetate	ND	ug/kg	12
Bromodichloromethane	ND	ug/kg	6.1
1,2-Dichloropropane	ND	ug/kg	6.1
cis-1,3-Dichloropropene	ND	ug/kg	6.1
Trichloroethene	ND	ug/kg	6.1
Dibromochloromethane	ND	ug/kg	6.1
1,1,2-Trichloroethane	ND	ug/kg	6.1
Benzene	ND	ug/kg	6.1
trans-1,3-Dichloropropene	ND	ug/kg	6.1
Bromoform	ND	ug/kg	6.1
4-Methyl-2-Pentanone	ND	ug/kg	12
2-Hexanone	ND	ug/kg	12
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.1
Tetrachloroethene	ND	ug/kg	6.1
Toluene	ND	ug/kg	6.1
Chlorobenzene	ND	ug/kg	6.1
Ethylbenzene	ND	ug/kg	6.1

Percent moisture is 18%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile Organics

Method 8240
(cont.)

Client Name: H+GCL
Client ID: TT-2 9312041100
Lab ID: 032021-0005-SA
Matrix: SOIL

(2.5)
Sampled: 04 DEC 93
Received: 07 DEC 93
Authorized: 08 DEC 93
Prepared: NA
Analyzed: 14 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Styrene	ND	ug/kg	6.1
Xylenes (total)	ND	ug/kg	6.1
Surrogate	Recovery		
1,2-Dichloroethane-d4	100	%	
Toluene-d8	105	%	
4-Bromofluorobenzene	94	%	

Percent moisture is 18%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile Organics

Method 8240

 Client Name: H+GCL
 Client ID: TT-2 9312041130
 Lab ID: 032021-0006-SA
 Matrix: SOIL

 (9.5')
 Sampled: 04 DEC 93
 Received: 07 DEC 93
 Authorized: 08 DEC 93
 Prepared: NA
 Analyzed: 14 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Chloromethane	ND	ug/kg	12
tert-Butyl Methyl ether	ND	ug/kg	6.0
Bromomethane	ND	ug/kg	12
Vinyl Chloride	ND	ug/kg	12
Chloroethane	ND	ug/kg	12
Methylene chloride	ND	ug/kg	6.0
Acetone	ND	ug/kg	12
Carbon disulfide	ND	ug/kg	6.0
1,1-Dichloroethene	ND	ug/kg	6.0
1,1-Dichloroethane	ND	ug/kg	6.0
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.0
Chloroform	ND	ug/kg	6.0
1,2-Dichloroethane	ND	ug/kg	6.0
2-Butanone	ND	ug/kg	12
1,1,1-Trichloroethane	ND	ug/kg	6.0
Carbon tetrachloride	ND	ug/kg	6.0
Vinyl Acetate	ND	ug/kg	12
Bromodichloromethane	ND	ug/kg	6.0
1,2-Dichloropropane	ND	ug/kg	6.0
cis-1,3-Dichloropropene	ND	ug/kg	6.0
Trichloroethene	ND	ug/kg	6.0
Dibromochloromethane	ND	ug/kg	6.0
1,1,2-Trichloroethane	ND	ug/kg	6.0
Benzene	ND	ug/kg	6.0
trans-1,3-Dichloropropene	ND	ug/kg	6.0
Bromoform	ND	ug/kg	6.0
4-Methyl-2-Pentanone	ND	ug/kg	12
2-Hexanone	ND	ug/kg	12
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.0
Tetrachloroethene	ND	ug/kg	6.0
Toluene	ND	ug/kg	6.0
Chlorobenzene	ND	ug/kg	6.0
Ethylbenzene	ND	ug/kg	6.0

Percent moisture is 16%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile Organics

Method 8240
(cont.)

(9.5')

Client Name: H+GCL
Client ID: TT-2 9312041130
Lab ID: 032021-0006-SA
Matrix: SOIL

Sampled: 04 DEC 93
Received: 07 DEC 93
Authorized: 08 DEC 93
Prepared: NA
Analyzed: 14 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Styrene	ND	ug/kg	6.0
Xylenes (total)	ND	ug/kg	6.0
Surrogate	Recovery		
1,2-Dichloroethane-d4	101	%	
Toluene-d8	104	%	
4-Bromofluorobenzene	97	%	

Percent moisture is 16%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile Organics

Method 8240

9312020905

TT-4(2.5' to 3.0')

Client Name: H+GCL
Client ID: TT-4
Lab ID: 031950-0010-SA
Matrix: SOIL

Sampled: 02 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93

Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	Units	Reporting Limit	
Chloromethane	ND	ug/kg	11	
tert-Butyl Methyl ether	48	ug/kg	5.7	
Bromomethane	ND	ug/kg	11	
Vinyl Chloride	ND	ug/kg	11	
Chloroethane	ND	ug/kg	11	
Methylene chloride	ND	ug/kg	5.7	
Acetone	29	ug/kg	11	
Carbon disulfide	4.2	ug/kg	5.7	J
1,1-Dichloroethene	ND	ug/kg	5.7	
1,1-Dichloroethane	ND	ug/kg	5.7	
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.7	
Chloroform	ND	ug/kg	5.7	
1,2-Dichloroethane	ND	ug/kg	5.7	
2-Butanone	7.4	ug/kg	11	J
1,1,1-Trichloroethane	ND	ug/kg	5.7	
Carbon tetrachloride	ND	ug/kg	5.7	
Vinyl Acetate	ND	ug/kg	11	
Bromodichloromethane	ND	ug/kg	5.7	
1,2-Dichloropropane	ND	ug/kg	5.7	
cis-1,3-Dichloropropene	ND	ug/kg	5.7	
Trichloroethene	ND	ug/kg	5.7	
Dibromochloromethane	ND	ug/kg	5.7	
1,1,2-Trichloroethane	ND	ug/kg	5.7	
Benzene	6.8	ug/kg	5.7	
trans-1,3-Dichloropropene	ND	ug/kg	5.7	
Bromoform	ND	ug/kg	5.7	
4-Methyl-2-Pentanone	ND	ug/kg	11	
2-Hexanone	ND	ug/kg	11	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.7	
Tetrachloroethene	ND	ug/kg	5.7	
Toluene	ND	ug/kg	5.7	
Chlorobenzene	ND	ug/kg	5.7	

Percent moisture is 12%. All results and limits are reported on a dry weight basis.

J = Result is detected below the reporting limit or is an estimated concentration.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile OrganicsMethod 8240
(cont.)

#9312020905

TT-4(2.5' to 3.0')

Client Name: H+GCL
Client ID: TT-4
Lab ID: 031950-0010-SA
Matrix: SOILSampled: 02 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Ethylbenzene	29	ug/kg	5.7
Styrene	ND	ug/kg	5.7
Xylenes (total)	ND	ug/kg	5.7
Surrogate	Recovery		
1,2-Dichloroethane-d4	100	%	
Toluene-d8	101	%	
4-Bromofluorobenzene	94	%	

Percent moisture is 12%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

9312020910

TT-4 (5.8' to 6.3')

Client Name: H+GCL
Client ID: TT-4
Lab ID: 031950-0011-SA
Matrix: SOIL

Sampled: 02 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93

Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chloromethane	ND	ug/kg	11
tert-Butyl Methyl ether	76	ug/kg	5.6
Bromomethane	ND	ug/kg	11
Vinyl Chloride	ND	ug/kg	11
Chloroethane	ND	ug/kg	11
Methylene chloride	ND	ug/kg	5.6
Acetone	18	ug/kg	11
Carbon disulfide	3.0	ug/kg	5.6
1,1-Dichloroethene	ND	ug/kg	5.6
1,1-Dichloroethane	ND	ug/kg	5.6
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	5.6
Chloroform	ND	ug/kg	5.6
1,2-Dichloroethane	ND	ug/kg	5.6
2-Butanone	ND	ug/kg	11
1,1,1-Trichloroethane	ND	ug/kg	5.6
Carbon tetrachloride	ND	ug/kg	5.6
Vinyl Acetate	ND	ug/kg	11
Bromodichloromethane	ND	ug/kg	5.6
1,2-Dichloropropane	ND	ug/kg	5.6
cis-1,3-Dichloropropene	ND	ug/kg	5.6
Trichloroethene	ND	ug/kg	5.6
Dibromochloromethane	ND	ug/kg	5.6
1,1,2-Trichloroethane	ND	ug/kg	5.6
Benzene	9.5	ug/kg	5.6
trans-1,3-Dichloropropene	ND	ug/kg	5.6
Bromoform	ND	ug/kg	5.6
4-Methyl-2-Pentanone	ND	ug/kg	11
2-Hexanone	ND	ug/kg	11
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.6
Tetrachloroethene	ND	ug/kg	5.6
Toluene	ND	ug/kg	5.6
Chlorobenzene	ND	ug/kg	5.6

J

Percent moisture is 11%. All results and limits are reported on a dry weight basis.

J = Result is detected below the reporting limit or is an estimated concentration.
NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240
(cont.)

#9312020910

TT-4(5.8' to 6.3')

Client Name: H+GCL
Client ID: TT-4
Lab ID: 031950-0011-SA
Matrix: SOIL

Sampled: 02 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93
Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Ethylbenzene	52	ug/kg	5.6
Styrene	ND	ug/kg	5.6
Xylenes (total)	ND	ug/kg	5.6
Surrogate	Recovery		
1,2-Dichloroethane-d4	97	%	
Toluene-d8	100	%	
4-Bromofluorobenzene	94	%	

Percent moisture is 11%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

Client Name: H+GCL
Client ID: TT-5 9312031215
Lab ID: 032021-0002-SA
Matrix: SOIL

(2.5'-3.0')

Sampled: 03 DEC 93
Received: 07 DEC 93
Authorized: 08 DEC 93

Prepared: NA
Analyzed: 13 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	13
tert-Butyl Methyl ether	ND	ug/kg	6.4
Bromomethane	ND	ug/kg	13
Vinyl Chloride	ND	ug/kg	13
Chloroethane	ND	ug/kg	13
Methylene chloride	ND	ug/kg	6.4
Acetone	62	ug/kg	13
Carbon disulfide	ND	ug/kg	6.4
1,1-Dichloroethene	ND	ug/kg	6.4
1,1-Dichloroethane	ND	ug/kg	6.4
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.4
Chloroform	ND	ug/kg	6.4
1,2-Dichloroethane	ND	ug/kg	6.4
2-Butanone	21	ug/kg	13
1,1,1-Trichloroethane	ND	ug/kg	6.4
Carbon tetrachloride	ND	ug/kg	6.4
Vinyl Acetate	ND	ug/kg	13
Bromodichloromethane	ND	ug/kg	6.4
1,2-Dichloropropane	ND	ug/kg	6.4
cis-1,3-Dichloropropene	ND	ug/kg	6.4
Trichloroethene	ND	ug/kg	6.4
Dibromochloromethane	ND	ug/kg	6.4
1,1,2-Trichloroethane	ND	ug/kg	6.4
Benzene	ND	ug/kg	6.4
trans-1,3-Dichloropropene	ND	ug/kg	6.4
Bromoform	ND	ug/kg	6.4
4-Methyl-2-Pentanone	ND	ug/kg	13
2-Hexanone	ND	ug/kg	13
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.4
Tetrachloroethene	ND	ug/kg	6.4
Toluene	ND	ug/kg	6.4
Chlorobenzene	ND	ug/kg	6.4

B

Percent moisture is 22%. All results and limits are reported on a dry weight basis.

B = Compound is also detected in the blank.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile OrganicsMethod 8240
(cont.)Client Name: H+GCL
Client ID: TT-5 9312031215
Lab ID: 032021-0002-SA
Matrix: SOIL(2.5' - 3.0')
Sampled: 03 DEC 93
Received: 07 DEC 93
Authorized: 08 DEC 93
Prepared: NA
Analyzed: 13 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Ethylbenzene	ND	ug/kg	6.4
Styrene	ND	ug/kg	6.4
Xylenes (total)	ND	ug/kg	6.4
Surrogate	Recovery		
1,2-Dichloroethane-d4	100	%	
Toluene-d8	103	%	
4-Bromofluorobenzene	98	%	

Percent moisture is 22%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: TT-5 9312031220
 Lab ID: 032021-0003-SA
 Matrix: SOIL

(7.5' - 7.8')

Sampled: 03 DEC 93
 Received: 07 DEC 93
 Authorized: 08 DEC 93

Prepared: NA
 Analyzed: 13 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Chloromethane	ND	ug/kg	12
tert-Butyl Methyl ether	26	ug/kg	6.2
Bromomethane	ND	ug/kg	12
Vinyl Chloride	ND	ug/kg	12
Chloroethane	ND	ug/kg	12
Methylene chloride	ND	ug/kg	6.2
Acetone	ND	ug/kg	12
Carbon disulfide	ND	ug/kg	6.2
1,1-Dichloroethene	ND	ug/kg	6.2
1,1-Dichloroethane	ND	ug/kg	6.2
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.2
Chloroform	ND	ug/kg	6.2
1,2-Dichloroethane	ND	ug/kg	6.2
2-Butanone	ND	ug/kg	12
1,1,1-Trichloroethane	ND	ug/kg	6.2
Carbon tetrachloride	ND	ug/kg	6.2
Vinyl Acetate	ND	ug/kg	12
Bromodichloromethane	ND	ug/kg	6.2
1,2-Dichloropropane	ND	ug/kg	6.2
cis-1,3-Dichloropropene	ND	ug/kg	6.2
Trichloroethene	ND	ug/kg	6.2
Dibromochloromethane	ND	ug/kg	6.2
1,1,2-Trichloroethane	ND	ug/kg	6.2
Benzene	ND	ug/kg	6.2
trans-1,3-Dichloropropene	ND	ug/kg	6.2
Bromoform	ND	ug/kg	6.2
4-Methyl-2-Pentanone	ND	ug/kg	12
2-Hexanone	ND	ug/kg	12
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.2
Tetrachloroethene	ND	ug/kg	6.2
Toluene	ND	ug/kg	6.2
Chlorobenzene	ND	ug/kg	6.2
Ethylbenzene	ND	ug/kg	6.2

Percent moisture is 19%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
 ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile OrganicsMethod 8240
(cont.)

(7.5' - 7.8')

Client Name: H+GCL
Client ID: TT-5 9312031220
Lab ID: 032021-0003-SA
Matrix: SOILSampled: 03 DEC 93
Received: 07 DEC 93
Authorized: 08 DEC 93Prepared: NA
Analyzed: 13 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Styrene	ND	ug/kg	6.2
Xylenes (total)	ND	ug/kg	6.2
Surrogate	Recovery		
1,2-Dichloroethane-d4	100	%	
Toluene-d8	101	%	
4-Bromofluorobenzene	100	%	

Percent moisture is 19%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

**Appendix G — Laboratory Analytical Data Sheets for
Arthur D. Little Sample Splits, Texaco Tutu, December 1993**



TT-1

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312101540
Lab ID: 032984-0008-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

Sampled: 10 DEC 93
Prepared: 23 DEC 93

Received: 18 DEC 93
Analyzed: 23 DEC 93

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	5000
Benzene	16000	ug/L	2500
Bromodichloromethane	ND	ug/L	2500
Bromoform	ND	ug/L	2500
Bromomethane	ND	ug/L	5000
2-Butanone (MEK)	ND	ug/L	5000
Carbon disulfide	ND	ug/L	2500
Carbon tetrachloride	ND	ug/L	2500
Chlorobenzene	ND	ug/L	2500
Chloroethane	ND	ug/L	5000
Chloroform	ND	ug/L	2500
Chloromethane	ND	ug/L	5000
Dibromochloromethane	ND	ug/L	2500
1,1-Dichloroethane	ND	ug/L	2500
1,2-Dichloroethane	ND	ug/L	2500
1,1-Dichloroethene	ND	ug/L	2500
1,2-Dichloroethene (total)	ND	ug/L	2500
1,2-Dichloropropane	ND	ug/L	2500
cis-1,3-Dichloropropene	ND	ug/L	2500
trans-1,3-Dichloropropene	ND	ug/L	2500
Ethylbenzene	3000	ug/L	2500
2-Hexanone	ND	ug/L	5000
tert-Butyl methyl ether	27000	ug/L	2500
Methylene chloride	7100	ug/L	2500
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5000
Styrene	ND	ug/L	2500
1,1,2,2-Tetrachloroethane	ND	ug/L	2500
Tetrachloroethene	ND	ug/L	2500
Toluene	13000	ug/L	2500
1,1,1-Trichloroethane	ND	ug/L	2500
1,1,2-Trichloroethane	ND	ug/L	2500
Trichloroethene	ND	ug/L	2500
Vinyl acetate	ND	ug/L	5000
Vinyl chloride	ND	ug/L	5000
Xylenes (total)	16000	ug/L	2500

Surrogate	Recovery
Toluene-d8	102 %

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

TUT 005 1531

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312101540
Lab ID: 032984-0008-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-1
Sampled: 10 DEC 93
Prepared: 23 DEC 93

Received: 18 DEC 93
Analyzed: 23 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene	97	%
1,2-Dichloroethane-d4	96	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

TUT 005 1532

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312101545
Lab ID: 032984-0009-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-1 (dup)
Sampled: 10 DEC 93
Prepared: 23 DEC 93

Received: 18 DEC 93
Analyzed: 23 DEC 93

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	5000
Benzene	17000	ug/L	2500
Bromodichloromethane	ND	ug/L	2500
Bromoform	ND	ug/L	2500
Bromomethane	ND	ug/L	5000
2-Butanone (MEK)	ND	ug/L	5000
Carbon disulfide	ND	ug/L	2500
Carbon tetrachloride	ND	ug/L	2500
Chlorobenzene	ND	ug/L	2500
Chloroethane	ND	ug/L	5000
Chloroform	ND	ug/L	2500
Chloromethane	ND	ug/L	5000
Dibromochloromethane	ND	ug/L	2500
1,1-Dichloroethane	ND	ug/L	2500
1,2-Dichloroethane	ND	ug/L	2500
1,1-Dichloroethene	ND	ug/L	2500
1,2-Dichloroethene	ND	ug/L	2500
(total)	ND	ug/L	2500
1,2-Dichloropropane	ND	ug/L	2500
cis-1,3-Dichloropropene	ND	ug/L	2500
trans-1,3-Dichloropropene	ND	ug/L	2500
Ethylbenzene	2900	ug/L	2500
2-Hexanone	ND	ug/L	5000
tert-Butyl methyl ether	27000	ug/L	2500
Methylene chloride	7000	ug/L	2500
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5000
Styrene	ND	ug/L	2500
1,1,2,2-Tetrachloroethane	ND	ug/L	2500
Tetrachloroethene	ND	ug/L	2500
Toluene	13000	ug/L	2500
1,1,1-Trichloroethane	ND	ug/L	2500
1,1,2-Trichloroethane	ND	ug/L	2500
Trichloroethene	ND	ug/L	2500
Vinyl acetate	ND	ug/L	5000
Vinyl chloride	ND	ug/L	5000
Xylenes (total)	16000	ug/L	2500

Surrogate Recovery

Toluene-d8 102 %

(continued on following page)

ND = Not detected
NA = Not applicable

TUT 005 1533

Reported By: Mike Hoffman

Approved By: Audrey Verniero

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312101545
Lab ID: 032984-0009-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-1 (Dup)

Sampled: 10 DEC 93
Prepared: 23 DEC 93

Received: 18 DEC 93
Analyzed: 23 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene
1,2-Dichloroethane-d4

98	%
98	%

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312101445
Lab ID: 032984-0007-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-1d

Sampled: 10 DEC 93
Prepared: 22 DEC 93

Received: 18 DEC 93
Analyzed: 24 DEC 93

Parameter	Result	Units	Reporting Limit	
Acetone	200	ug/L	120	
Benzene	1600	ug/L	62	
Bromodichloromethane	ND	ug/L	62	
Bromoform	ND	ug/L	62	
Bromomethane	ND	ug/L	120	
2-Butanone (MEK)	ND	ug/L	120	
Carbon disulfide	ND	ug/L	62	
Carbon tetrachloride	ND	ug/L	62	
Chlorobenzene	ND	ug/L	62	
Chloroethane	ND	ug/L	120	
Chloroform	ND	ug/L	62	
Chloromethane	ND	ug/L	120	
Dibromochloromethane	ND	ug/L	62	
1,1-Dichloroethane	ND	ug/L	62	
1,2-Dichloroethane	33	ug/L	62	J
1,1-Dichloroethene	ND	ug/L	62	
1,2-Dichloroethene				
(total)	330	ug/L	62	
1,2-Dichloropropane	ND	ug/L	62	
cis-1,3-Dichloropropene	ND	ug/L	62	
trans-1,3-Dichloropropene	ND	ug/L	62	
Ethylbenzene	65	ug/L	62	
2-Hexanone	ND	ug/L	120	
tert-Butyl methyl ether	1500	ug/L	62	
Methylene chloride	160	ug/L	62	
4-Methyl-2-pentanone				
(MIBK)	ND	ug/L	120	
Styrene	ND	ug/L	62	
1,1,2,2-Tetrachloroethane	ND	ug/L	62	
Tetrachloroethene	58	ug/L	62	J
Toluene	260	ug/L	62	
1,1,1-Trichloroethane	ND	ug/L	62	
1,1,2-Trichloroethane	ND	ug/L	62	
Trichloroethene	22	ug/L	62	J
Vinyl acetate	ND	ug/L	120	
Vinyl chloride	22	ug/L	120	J
Xylenes (total)	620	ug/L	62	

Surrogate	Recovery	
Toluene-d8	98	%

(continued on following page)

ND = Not detected
NA = Not applicable

TUT 005 1535

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Enseco
A Chemung Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312101115
Lab ID: 032984-0005-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-2
Sampled: 10 DEC 93
Prepared: 22 DEC 93

Received: 18 DEC 93
Analyzed: 22 DEC 93

Parameter	Result	Units	Reporting Limit	
Acetone	ND	ug/L	10	
Benzene	1.0	ug/L	5.0	J
Bromodichloromethane	ND	ug/L	5.0	
Bromoform	ND	ug/L	5.0	
Bromomethane	ND	ug/L	10	
2-Butanone (MEK)	ND	ug/L	10	
Carbon disulfide	ND	ug/L	5.0	
Carbon tetrachloride	ND	ug/L	5.0	
Chlorobenzene	ND	ug/L	5.0	
Chloroethane	ND	ug/L	10	
Chloroform	1.4	ug/L	5.0	J
Chloromethane	ND	ug/L	10	
Dibromochloromethane	ND	ug/L	5.0	
1,1-Dichloroethane	ND	ug/L	5.0	
1,2-Dichloroethane	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	5.0	
1,2-Dichloroethene				
(total)	210	ug/L	5.0	
1,2-Dichloropropane	ND	ug/L	5.0	
cis-1,3-Dichloropropene	ND	ug/L	5.0	
trans-1,3-Dichloropropene	ND	ug/L	5.0	
Ethylbenzene	ND	ug/L	5.0	
2-Hexanone	ND	ug/L	10	
tert-Butyl methyl ether	3.0	ug/L	5.0	J
Methylene chloride	7.8	ug/L	5.0	
4-Methyl-2-pentanone				
(MIBK)	ND	ug/L	10	
Styrene	ND	ug/L	5.0	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	
Tetrachloroethene	30	ug/L	5.0	
Toluene	1.2	ug/L	5.0	J
1,1,1-Trichloroethane	ND	ug/L	5.0	
1,1,2-Trichloroethane	ND	ug/L	5.0	
Trichloroethene	10	ug/L	5.0	
Vinyl acetate	ND	ug/L	10	
Vinyl chloride	ND	ug/L	10	
Xylenes (total)	2.5	ug/L	5.0	J

Surrogate Recovery

Toluene-d8 103 %

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312101445
Lab ID: 032984-0007-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-1d

Sampled: 10 DEC 93
Prepared: 22 DEC 93

Received: 18 DEC 93
Analyzed: 24 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene	100	%
1,2-Dichloroethane-d4	95	%

Note J : Result is detected below the reporting limit or is an estimated concentration.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Enseco
A Century Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312101115
Lab ID: 032984-0005-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-2

Sampled: 10 DEC 93
Prepared: 22 DEC 93

Received: 18 DEC 93
Analyzed: 22 DEC 93

Parameter	Result	Units	Reporting Limit	
Acetone	ND	ug/L	10	
Benzene	1.0	ug/L	5.0	J
Bromodichloromethane	ND	ug/L	5.0	
Bromoform	ND	ug/L	5.0	
Bromomethane	ND	ug/L	10	
2-Butanone (MEK)	ND	ug/L	10	
Carbon disulfide	ND	ug/L	5.0	
Carbon tetrachloride	ND	ug/L	5.0	
Chlorobenzene	ND	ug/L	5.0	
Chloroethane	ND	ug/L	10	
Chloroform	1.4	ug/L	5.0	J
Chloromethane	ND	ug/L	10	
Dibromochloromethane	ND	ug/L	5.0	
1,1-Dichloroethane	ND	ug/L	5.0	
1,2-Dichloroethane	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	5.0	
1,2-Dichloroethene				
(total)	210	ug/L	5.0	
1,2-Dichloropropane	ND	ug/L	5.0	
cis-1,3-Dichloropropene	ND	ug/L	5.0	
trans-1,3-Dichloropropene	ND	ug/L	5.0	
Ethylbenzene	ND	ug/L	5.0	
2-Hexanone	ND	ug/L	10	
tert-Butyl methyl ether	3.0	ug/L	5.0	J
Methylene chloride	7.8	ug/L	5.0	
4-Methyl-2-pentanone				
(MIBK)	ND	ug/L	10	
Styrene	ND	ug/L	5.0	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	
Tetrachloroethene	30	ug/L	5.0	
Toluene	1.2	ug/L	5.0	J
1,1,1-Trichloroethane	ND	ug/L	5.0	
1,1,2-Trichloroethane	ND	ug/L	5.0	
Trichloroethene	10	ug/L	5.0	
Vinyl acetate	ND	ug/L	10	
Vinyl chloride	ND	ug/L	10	
Xylenes (total)	2.5	ug/L	5.0	J
Surrogate	Recovery			
Toluene-d8	103	%		

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

TUT 005 1538

Enseco
A Corning CompanyVolatile Organics
Target Compound List (TCL)
Method 8240Client Name: H+GCL
Client ID: 9312101115
Lab ID: 032984-0005-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93TT-2
Sampled: 10 DEC 93
Prepared: 22 DEC 93Received: 18 DEC 93
Analyzed: 22 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene
1,2-Dichloroethane-d499 %
98 %

Note J : Result is detected below the reporting limit or is an
estimated concentration.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Enseco
A Laboratory Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312100905
Lab ID: 032984-0003-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-3cd

Sampled: 10 DEC 93
Prepared: 23 DEC 93

Received: 18 DEC 93
Analyzed: 23 DEC 93

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	50
Benzene	ND	ug/L	25
Bromodichloromethane	ND	ug/L	25
Bromoform	ND	ug/L	25
Bromomethane	ND	ug/L	50
2-Butanone (MEK)	ND	ug/L	50
Carbon disulfide	ND	ug/L	25
Carbon tetrachloride	ND	ug/L	25
Chlorobenzene	ND	ug/L	25
Chloroethane	ND	ug/L	50
Chloroform	ND	ug/L	25
Chloromethane	ND	ug/L	50
Dibromochloromethane	ND	ug/L	25
1,1-Dichloroethane	ND	ug/L	25
1,2-Dichloroethane	ND	ug/L	25
1,1-Dichloroethene	ND	ug/L	25
1,2-Dichloroethene	ND	ug/L	25
(total)	520	ug/L	25
1,2-Dichloropropane	ND	ug/L	25
cis-1,3-Dichloropropene	ND	ug/L	25
trans-1,3-Dichloropropene	ND	ug/L	25
Ethylbenzene	ND	ug/L	25
2-Hexanone	ND	ug/L	50
tert-Butyl methyl ether	ND	ug/L	25
Methylene chloride	63	ug/L	25
4-Methyl-2-pentanone			
(MIBK)	ND	ug/L	50
Styrene	ND	ug/L	25
1,1,2,2-Tetrachloroethane	ND	ug/L	25
Tetrachloroethene	43	ug/L	25
Toluene	ND	ug/L	25
1,1,1-Trichloroethane	ND	ug/L	25
1,1,2-Trichloroethane	ND	ug/L	25
Trichloroethene	33	ug/L	25
Vinyl acetate	ND	ug/L	50
Vinyl chloride	150	ug/L	50
Xylenes (total)	ND	ug/L	25

Surrogate

Recovery

Toluene-d8

103 %

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

Enseco
A Chemical CompanyVolatile Organics
Target Compound List (TCL)
Method 8240Client Name: H+GCL
Client ID: 9312100905
Lab ID: 032984-0003-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93TT-3c1
Sampled: 10 DEC 93
Prepared: 23 DEC 93Received: 18 DEC 93
Analyzed: 23 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene
1,2-Dichloroethane-d498 %
94 %ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312101230
Lab ID: 032984-0006-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-4

Sampled: 10 DEC 93
Prepared: 23 DEC 93

Received: 18 DEC 93
Analyzed: 23 DEC 93

Parameter	Result	Units	Reporting Limit	
Acetone	1700	ug/L	5000	J
Benzene	23000	ug/L	2500	
Bromodichloromethane	ND	ug/L	2500	
Bromoform	ND	ug/L	2500	
Bromomethane	ND	ug/L	5000	
2-Butanone (MEK)	ND	ug/L	5000	
Carbon disulfide	ND	ug/L	2500	
Carbon tetrachloride	ND	ug/L	2500	
Chlorobenzene	ND	ug/L	2500	
Chloroethane	ND	ug/L	5000	
Chloroform	ND	ug/L	2500	
Chloromethane	ND	ug/L	5000	
Dibromochloromethane	ND	ug/L	2500	
1,1-Dichloroethane	ND	ug/L	2500	
1,2-Dichloroethane	ND	ug/L	2500	
1,1-Dichloroethene	ND	ug/L	2500	
1,2-Dichloroethene	ND	ug/L	2500	
(total)	ND	ug/L	2500	
1,2-Dichloropropane	ND	ug/L	2500	
cis-1,3-Dichloropropene	ND	ug/L	2500	
trans-1,3-Dichloropropene	ND	ug/L	2500	
Ethylbenzene	3000	ug/L	2500	
2-Hexanone	ND	ug/L	5000	
tert-Butyl methyl ether	52000	ug/L	2500	
Methylene chloride	7000	ug/L	2500	
4-Methyl-2-pentanone				
(MIBK)	ND	ug/L	5000	
Styrene	ND	ug/L	2500	
1,1,2,2-Tetrachloroethane	ND	ug/L	2500	
Tetrachloroethene	ND	ug/L	2500	
Toluene	25000	ug/L	2500	
1,1,1-Trichloroethane	ND	ug/L	2500	
1,1,2-Trichloroethane	ND	ug/L	2500	
Trichloroethene	ND	ug/L	2500	
Vinyl acetate	ND	ug/L	5000	
Vinyl chloride	ND	ug/L	5000	
Xylenes (total)	17000	ug/L	2500	
Surrogate	Recovery			
Toluene-d8	98	%		

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312101230
Lab ID: 032984-0006-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-4

Sampled: 10 DEC 93
Prepared: 23 DEC 93

Received: 18 DEC 93
Analyzed: 23 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene	97	%
1,2-Dichloroethane-d4	96	%

Note J : Result is detected below the reporting limit or is an estimated concentration.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

Enseco
A Cuming Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312101010
Lab ID: 032984-0004-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

T1-5
Sampled: 10 DEC 93
Prepared: 23 DEC 93

Received: 18 DEC 93
Analyzed: 23 DEC 93

Parameter	Result	Units	Reporting Limit	
Acetone	ND	ug/L	20	
Benzene	9.1	ug/L	10	J
Bromodichloromethane	ND	ug/L	10	
Bromoform	ND	ug/L	10	
Bromomethane	ND	ug/L	20	
2-Butanone (MEK)	ND	ug/L	20	
Carbon disulfide	ND	ug/L	10	
Carbon tetrachloride	ND	ug/L	10	
Chlorobenzene	ND	ug/L	10	
Chloroethane	ND	ug/L	20	
Chloroform	ND	ug/L	10	
Chloromethane	ND	ug/L	20	
Dibromochloromethane	ND	ug/L	10	
1,1-Dichloroethane	ND	ug/L	10	
1,2-Dichloroethane	ND	ug/L	10	
1,1-Dichloroethene	ND	ug/L	10	
1,2-Dichloroethene				
(total)	280	ug/L	10	
1,2-Dichloropropane	ND	ug/L	10	
cis-1,3-Dichloropropene	ND	ug/L	10	
trans-1,3-Dichloropropene	ND	ug/L	10	
Ethylbenzene	11	ug/L	10	
2-Hexanone	ND	ug/L	20	
tert-Butyl methyl ether	90	ug/L	10	
Methylene chloride	23	ug/L	10	
4-Methyl-2-pentanone				
(MIBK)	ND	ug/L	20	
Styrene	ND	ug/L	10	
1,1,2,2-Tetrachloroethane	ND	ug/L	10	
Tetrachloroethene	31	ug/L	10	
Toluene	13	ug/L	10	
1,1,1-Trichloroethane	ND	ug/L	10	
1,1,2-Trichloroethane	ND	ug/L	10	
Trichloroethene	47	ug/L	10	
Vinyl acetate	ND	ug/L	20	
Vinyl chloride	42	ug/L	20	
Xylenes (total)	22	ug/L	10	
Surrogate	Recovery			
Toluene-d8	98	%		

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

TUT 005 1544

Enseco
A Corning CompanyVolatile Organics
Target Compound List (TCL)
Method 8240Client Name: H+GCL
Client ID: 9312101010
Lab ID: 032984-0004-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93TT-5
Sampled: 10 DEC 93
Prepared: 23 DEC 93Received: 18 DEC 93
Analyzed: 23 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene	100	%
1,2-Dichloroethane-d4	99	%

Note J : Result is detected below the reporting limit or is an estimated concentration.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

TCL Volatile Organics

Client Name: H+GCL	Method 8240	<i>OIL/WATER</i>
Client ID: TEXACO	# <i>9312011240</i>	<i>SEPARATOR</i>
Lab ID: 031950-0015-SA	Sampled: 01 DEC 93	Prepared: NA
Matrix: AQUEOUS	Received: 03 DEC 93	Analyzed: 09 DEC 93
	Authorized: 05 DEC 93	

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	10
Bromomethane	ND	ug/L	10
tert-Butyl Methyl ether	ND	ug/L	5.0
Vinyl Chloride	ND	ug/L	10
Chloroethane	ND	ug/L	10
Methylene chloride	ND	ug/L	5.0
Acetone	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/L	5.0
Chloroform	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
2-Butanone	ND	ug/L	10
1,1,1-Trichloroethane	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Vinyl Acetate	ND	ug/L	10
Bromodichloromethane	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Benzene	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
4-Methyl-2-Pentanone	ND	ug/L	10
2-Hexanone	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Ethylbenzene	ND	ug/L	5.0

NA = Not Applicable
 ND = Not Detected

Reported By: Kelvin Wang

Approved By: Dennis Flynn

TCL Volatile Organics

Client Name: H+GCL
Client ID: TEXACO
Lab ID: 031950-0015-SA
Matrix: AQUEOUS

Method 8240
(cont.)
#9312011240

*OIL/WATER
SEPARATOR*

Sampled: 01 DEC 93
Received: 03 DEC 93
Authorized: 05 DEC 93

Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	Units	Reporting Limit
Styrene	ND	ug/L	5.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	Recovery		
Toluene-d8	98	%	
4-Bromofluorobenzene	92	%	
1,2-Dichloroethane-d4	104	%	

NA = Not Applicable
ND = Not Detected

Reported By: Kelvin Wang

Approved By: Dennis Flynn

Enseco
A Chemung Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312111645
Lab ID: 032984-0011-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

WASTE WATER - TANK 1

Sampled: 10 DEC 93
Prepared: 22 DEC 93

Received: 18 DEC 93
Analyzed: 24 DEC 93

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	250
Benzene	1000	ug/L	120
Bromodichloromethane	ND	ug/L	120
Bromoform	ND	ug/L	120
Bromomethane	ND	ug/L	250
2-Butanone (MEK)	ND	ug/L	250
Carbon disulfide	ND	ug/L	120
Carbon tetrachloride	ND	ug/L	120
Chlorobenzene	ND	ug/L	120
Chloroethane	ND	ug/L	250
Chloroform	ND	ug/L	120
Chloromethane	ND	ug/L	250
Dibromochloromethane	ND	ug/L	120
1,1-Dichloroethane	ND	ug/L	120
1,2-Dichloroethane	ND	ug/L	120
1,1-Dichloroethene	ND	ug/L	120
1,2-Dichloroethene	ND	ug/L	120
(total)	46	ug/L	120
1,2-Dichloropropane	ND	ug/L	120
cis-1,3-Dichloropropene	ND	ug/L	120
trans-1,3-Dichloropropene	ND	ug/L	120
Ethylbenzene	ND	ug/L	120
2-Hexanone	ND	ug/L	250
tert-Butyl methyl ether	3400	ug/L	120
Methylene chloride	340	ug/L	120
4-Methyl-2-pentanone	ND	ug/L	250
(MIBK)	ND	ug/L	120
Styrene	ND	ug/L	120
1,1,2,2-Tetrachloroethane	ND	ug/L	120
Tetrachloroethene	ND	ug/L	120
Toluene	200	ug/L	120
1,1,1-Trichloroethane	ND	ug/L	120
1,1,2-Trichloroethane	ND	ug/L	120
Trichloroethene	ND	ug/L	120
Vinyl acetate	ND	ug/L	250
Vinyl chloride	ND	ug/L	250
Xylenes (total)	510	ug/L	120

J

Surrogate

Recovery

Toluene-d8

99

%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Enseco
A Chemical CompanyVolatile Organics
Target Compound List (TCL)
Method 8240Client Name: H+GCL
Client ID: 9312111645
Lab ID: 032984-0011-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

WASTE WATER - Tank 1

Sampled: 10 DEC 93
Prepared: 22 DEC 93Received: 18 DEC 93
Analyzed: 24 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene	99	%
1,2-Dichloroethane-d4	98	%

Note J : Result is detected below the reporting limit or is an estimated concentration.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Enseco
A Chemco Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312111650
Lab ID: 032984-0012-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

WASTE WATER TANK 2

Sampled: 10 DEC 93 Received: 18 DEC 93
Prepared: 22 DEC 93 Analyzed: 24 DEC 93

Parameter	Result	Units	Reporting Limit
Acetone	100	ug/L	50
Benzene	150	ug/L	25
Bromodichloromethane	ND	ug/L	25
Bromoform	ND	ug/L	25
Bromomethane	ND	ug/L	50
2-Butanone (MEK)	ND	ug/L	50
Carbon disulfide	ND	ug/L	25
Carbon tetrachloride	ND	ug/L	25
Chlorobenzene	ND	ug/L	25
Chloroethane	ND	ug/L	50
Chloroform	ND	ug/L	25
Chloromethane	ND	ug/L	50
Dibromochloromethane	ND	ug/L	25
1,1-Dichloroethane	ND	ug/L	25
1,2-Dichloroethane	ND	ug/L	25
1,1-Dichloroethene	ND	ug/L	25
1,2-Dichloroethene	ND	ug/L	25
(total)	ND	ug/L	25
1,2-Dichloropropane	ND	ug/L	25
cis-1,3-Dichloropropene	ND	ug/L	25
trans-1,3-Dichloropropene	ND	ug/L	25
Ethylbenzene	60	ug/L	25
2-Hexanone	ND	ug/L	50
tert-Butyl methyl ether	630	ug/L	25
Methylene chloride	61	ug/L	25
4-Methyl-2-pentanone	ND	ug/L	50
(MIBK)	ND	ug/L	25
Styrene	ND	ug/L	25
1,1,2,2-Tetrachloroethane	ND	ug/L	25
Tetrachloroethene	ND	ug/L	25
Toluene	13	ug/L	25
1,1,1-Trichloroethane	ND	ug/L	25
1,1,2-Trichloroethane	ND	ug/L	25
Trichloroethene	ND	ug/L	25
Vinyl acetate	ND	ug/L	50
Vinyl chloride	ND	ug/L	50
Xylenes (total)	740	ug/L	25

Surrogate	Recovery
Toluene-d8	101 %

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Enseco
A Corning CompanyVolatile Organics
Target Compound List (TCL)
Method 8240Client Name: H+GCL
Client ID: 9312111650
Lab ID: 032984-0012-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

WASTE WATER - TANK 2

Sampled: 10 DEC 93
Prepared: 22 DEC 93Received: 18 DEC 93
Analyzed: 24 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene
1,2-Dichloroethane-d4102 %
99 %Note J : Result is detected below the reporting limit or is an
estimated concentration.ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Appendix H — Laboratory Analytical Data Sheets for Groundwater and Wastewater Samples, Texaco Tutu, December 1993

Enseco
A Corning Company

TCL Volatile Organics

Method 8240

WASTE OIL
Drum 513

Client Name: H+GCL
Client ID: 9312131040
Lab ID: 032984-0016-SA
Matrix: WASTE
Authorized: 18 DEC 93

Sampled: 10 DEC 93
Prepared: 24 DEC 93

Received: 18 DEC 93
Analyzed: 24 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	mg/kg	100
Bromomethane	ND	mg/kg	100
Vinyl chloride	ND	mg/kg	100
Chloroethane	ND	mg/kg	100
Methylene chloride	ND	mg/kg	50
Acetone	ND	mg/kg	100
Carbon disulfide	ND	mg/kg	50
1,1-Dichloroethene	ND	mg/kg	50
1,1-Dichloroethane	ND	mg/kg	50
1,2-Dichloroethene (cis/trans)	ND	mg/kg	50
Chloroform	ND	mg/kg	50
1,2-Dichloroethane	ND	mg/kg	50
2-Butanone	ND	mg/kg	100
1,1,1-Trichloroethane	77	mg/kg	50
Carbon tetrachloride	ND	mg/kg	50
Vinyl acetate	ND	mg/kg	100
Bromodichloromethane	ND	mg/kg	50
1,2-Dichloropropane	ND	mg/kg	50
cis-1,3-Dichloropropene	ND	mg/kg	50
Trichloroethene	ND	mg/kg	50
Dibromochloromethane	ND	mg/kg	50
1,1,2-Trichloroethane	ND	mg/kg	50
Benzene	ND	mg/kg	50
trans-1,3-Dichloropropene	ND	mg/kg	50
Bromoform	ND	mg/kg	50
4-Methyl-2-pentanone	ND	mg/kg	100
2-Hexanone	ND	mg/kg	100
1,1,2,2-Tetrachloroethane	ND	mg/kg	50
Tetrachloroethene	56	mg/kg	50
Toluene	550	mg/kg	50
Chlorobenzene	ND	mg/kg	50
Ethylbenzene	150	mg/kg	50
Styrene	ND	mg/kg	50
Xylenes (total)	1200	mg/kg	50
tert-Butyl methyl ether	ND	mg/kg	50

Surrogate	Recovery	
Toluene-d8	ND	%
4-Bromofluorobenzene	ND	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Paul Reinwald

Approved By: Kristin Tollefson

Enseco
A Learning Company

TCL Volatile Organics (CONT.)

Method 8240

Client Name: H+GCL
Client ID: 9312131040
Lab ID: 032984-0016-SA
Matrix: WASTE
Authorized: 18 DEC 93

Sampled: 10 DEC 93
Prepared: 24 DEC 93

Received: 18 DEC 93
Analyzed: 24 DEC 93

Surrogate

Recovery

1,2-Dichloroethane-d4

ND %

ND = Not detected
NA = Not applicable

Reported By: Paul Reinwald

Approved By: Kristin Tollefson

Enseco
A Chemung Company

TCL Volatile Organics

Method 8240

WASTE OIL

Drum 534

Client Name: H+GCL
Client ID: 9312131010
Lab ID: 032984-0015-SA
Matrix: WASTE
Authorized: 18 DEC 93

Sampled: 10 DEC 93
Prepared: 24 DEC 93

Received: 18 DEC 93
Analyzed: 24 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	mg/kg	1.0
Bromomethane	ND	mg/kg	1.0
Vinyl chloride	ND	mg/kg	1.0
Chloroethane	ND	mg/kg	1.0
Methylene chloride	1.2	mg/kg	0.50
Acetone	ND	mg/kg	1.0
Carbon disulfide	ND	mg/kg	0.50
1,1-Dichloroethene	ND	mg/kg	0.50
1,1-Dichloroethane	ND	mg/kg	0.50
1,2-Dichloroethene (cis/trans)	ND	mg/kg	0.50
Chloroform	ND	mg/kg	0.50
1,2-Dichloroethane	ND	mg/kg	0.50
2-Butanone	ND	mg/kg	1.0
1,1,1-Trichloroethane	ND	mg/kg	0.50
Carbon tetrachloride	ND	mg/kg	0.50
Vinyl acetate	ND	mg/kg	1.0
Bromodichloromethane	ND	mg/kg	0.50
1,2-Dichloropropane	ND	mg/kg	0.50
cis-1,3-Dichloropropene	ND	mg/kg	0.50
Trichloroethene	ND	mg/kg	0.50
Dibromochloromethane	ND	mg/kg	0.50
1,1,2-Trichloroethane	ND	mg/kg	0.50
Benzene	ND	mg/kg	0.50
trans-1,3-Dichloropropene	ND	mg/kg	0.50
Bromoform	ND	mg/kg	0.50
4-Methyl-2-pentanone	ND	mg/kg	1.0
2-Hexanone	ND	mg/kg	1.0
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.50
Tetrachloroethene	ND	mg/kg	0.50
Toluene	0.16	mg/kg	0.50
Chlorobenzene	ND	mg/kg	0.50
Ethylbenzene	0.62	mg/kg	0.50
Styrene	ND	mg/kg	0.50
Xylenes (total)	1.2	mg/kg	0.50
tert-Butyl methyl ether	ND	mg/kg	0.50

Surrogate	Recovery
-----------	----------

Toluene-d8	71 %
4-Bromofluorobenzene	80 %

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Enseco
A Chemical Company

TCL Volatile Organics (CONT.)

Method 8240

Client Name: H+GCL
Client ID: 9312131010
Lab ID: 032984-0015-SA
Matrix: WASTE
Authorized: 18 DEC 93

Sampled: 10 DEC 93
Prepared: 24 DEC 93

Received: 18 DEC 93
Analyzed: 24 DEC 93

Surrogate

Recovery

1,2-Dichloroethane-d4

69 %

Note J : Result is detected below the reporting limit or is an
estimated concentration.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Enseco
A Caring Company

TCL Volatile Organics

Method 8240

Client Name: H+GCL
Client ID: 9312130945
Lab ID: 032984-0013-SA
Matrix: WASTE
Authorized: 18 DEC 93

WASTE OIL
DRUM 544
Sampled: 10 DEC 93
Prepared: 24 DEC 93

Received: 18 DEC 93
Analyzed: 24 DEC 93

Parameter	Result	Units	Reporting Limit	
Chloromethane	ND	mg/kg	2.0	
Bromomethane	ND	mg/kg	2.0	
Vinyl chloride	ND	mg/kg	2.0	
Chloroethane	ND	mg/kg	2.0	
Methylene chloride	2.6	mg/kg	1.0	
Acetone	1.9	mg/kg	2.0	J
Carbon disulfide	ND	mg/kg	1.0	
1,1-Dichloroethene	ND	mg/kg	1.0	
1,1-Dichloroethane	ND	mg/kg	1.0	
1,2-Dichloroethene				
(cis/trans)	ND	mg/kg	1.0	
Chloroform	ND	mg/kg	1.0	
1,2-Dichloroethane	ND	mg/kg	1.0	
2-Butanone	ND	mg/kg	2.0	
1,1,1-Trichloroethane	ND	mg/kg	1.0	
Carbon tetrachloride	ND	mg/kg	1.0	
Vinyl acetate	ND	mg/kg	2.0	
Bromodichloromethane	ND	mg/kg	1.0	
1,2-Dichloropropane	ND	mg/kg	1.0	
cis-1,3-Dichloropropene	ND	mg/kg	1.0	
Trichloroethene	ND	mg/kg	1.0	
Dibromochloromethane	ND	mg/kg	1.0	
1,1,2-Trichloroethane	ND	mg/kg	1.0	
Benzene	0.22	mg/kg	1.0	J
trans-1,3-Dichloropropene	ND	mg/kg	1.0	
Bromoform	ND	mg/kg	1.0	
4-Methyl-2-pentanone	ND	mg/kg	2.0	
2-Hexanone	ND	mg/kg	2.0	
1,1,2,2-Tetrachloroethane	ND	mg/kg	1.0	
Tetrachloroethene	ND	mg/kg	1.0	
Toluene	1.8	mg/kg	1.0	
Chlorobenzene	ND	mg/kg	1.0	
Ethylbenzene	4.7	mg/kg	1.0	
Styrene	ND	mg/kg	1.0	
Xylenes (total)	19	mg/kg	1.0	
tert-Butyl methyl ether	ND	mg/kg	1.0	
Surrogate	Recovery			
Toluene-d8	54	%		
4-Bromofluorobenzene	60	%		

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312111130
Lab ID: 032984-0010-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-6

Sampled: 10 DEC 93
Prepared: 23 DEC 93

Received: 18 DEC 93
Analyzed: 23 DEC 93

Parameter	Result	Units	Reporting Limit	
Acetone	15	ug/L	10	
Benzene	2.1	ug/L	5.0	J
Bromodichloromethane	ND	ug/L	5.0	
Bromoform	ND	ug/L	5.0	
Bromomethane	ND	ug/L	10	
2-Butanone (MEK)	ND	ug/L	10	
Carbon disulfide	ND	ug/L	5.0	
Carbon tetrachloride	ND	ug/L	5.0	
Chlorobenzene	ND	ug/L	5.0	
Chloroethane	ND	ug/L	10	
Chloroform	4.3	ug/L	5.0	J
Chloromethane	ND	ug/L	10	
Dibromochloromethane	ND	ug/L	5.0	
1,1-Dichloroethane	ND	ug/L	5.0	
1,2-Dichloroethane	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	5.0	
1,2-Dichloroethene				
(total)	180	ug/L	5.0	
1,2-Dichloropropane	ND	ug/L	5.0	
cis-1,3-Dichloropropene	ND	ug/L	5.0	
trans-1,3-Dichloropropene	ND	ug/L	5.0	
Ethylbenzene	ND	ug/L	5.0	
2-Hexanone	ND	ug/L	10	
tert-Butyl methyl ether	150	ug/L	5.0	
Methylene chloride	8.7	ug/L	5.0	
4-Methyl-2-pentanone				
(MIBK)	ND	ug/L	10	
Styrene	ND	ug/L	5.0	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	
Tetrachloroethene	48	ug/L	5.0	
Toluene	ND	ug/L	5.0	
1,1,1-Trichloroethane	ND	ug/L	5.0	
1,1,2-Trichloroethane	ND	ug/L	5.0	
Trichloroethene	15	ug/L	5.0	
Vinyl acetate	ND	ug/L	10	
Vinyl chloride	ND	ug/L	10	
Xylenes (total)	ND	ug/L	5.0	
Surrogate	Recovery			
Toluene-d8	103	%		

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

Enseco
A Chemical CompanyVolatile Organics
Target Compound List (TCL)
Method 8240Client Name: H+GCL
Client ID: 9312111130
Lab ID: 032984-0010-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TT-6

Sampled: 10 DEC 93
Prepared: 23 DEC 93Received: 18 DEC 93
Analyzed: 23 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene	98	%
1,2-Dichloroethane-d4	97	%

Note J : Result is detected below the reporting limit or is an estimated concentration.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero



TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: 9312071430
 Lab ID: 032087-0009-SA
 Matrix: AQUEOUS

MW-3
 Sampled: 07 DEC 93
 Received: 09 DEC 93
 Authorized: 12 DEC 93
 Prepared: NA
 Analyzed: 16 DEC 93

Parameter	Result	Units	Reporting Limit	
Chloromethane	ND	ug/L	50	u
Bromomethane	ND	ug/L	50	
tert-Butyl Methyl ether	ND	ug/L	25	
Vinyl Chloride	56	ug/L	50	
Chloroethane	ND	ug/L	50	
Methylene chloride	ND	ug/L	25	
Acetone	ND	ug/L	50	
Carbon disulfide	ND	ug/L	25	
1,1-Dichloroethene	ND	ug/L	25	
1,1-Dichloroethane	ND	ug/L	25	
1,2-Dichloroethene (cis/trans)	140	ug/L	25	
Chloroform	ND	ug/L	25	
1,2-Dichloroethane	ND	ug/L	25	
2-Butanone	ND	ug/L	50	
1,1,1-Trichloroethane	ND	ug/L	25	
Carbon tetrachloride	ND	ug/L	25	
Vinyl Acetate	ND	ug/L	50	
Bromodichloromethane	ND	ug/L	25	
1,2-Dichloropropane	ND	ug/L	25	
trans-1,3-Dichloropropene	ND	ug/L	25	
Trichloroethene	12	ug/L	25	J
Dibromochloromethane	ND	ug/L	25	
1,1,2-Trichloroethane	ND	ug/L	25	
Benzene	6.2	ug/L	25	J
cis-1,3-Dichloropropene	ND	ug/L	25	
Bromoform	ND	ug/L	25	
4-Methyl-2-Pentanone	ND	ug/L	50	
2-Hexanone	ND	ug/L	50	
1,1,2,2-Tetrachloroethane	ND	ug/L	25	
Tetrachloroethene	7.6	ug/L	25	J
Toluene	6.4	ug/L	25	J

J = Result is detected below the reporting limit or is an estimated concentration.

u = All reporting limits raised due to high levels of target analytes.

NA = Not Applicable

ND = Not Detected

Reported By: Clifford Merceron

Approved By: David Ercoliani



TCL Volatile Organics

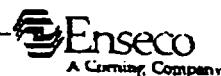
Method 8240
(cont.)Client Name: H+GCL
Client ID: 9312071430
Lab ID: 032087-0009-SA
Matrix: AQUEOUSmw - 3
Sampled: 07 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93Prepared: NA
Analyzed: 16 DEC 93

Parameter	Result	Units	Reporting Limit	
Chlorobenzene	6.7	ug/L	25	J
Ethylbenzene	ND	ug/L	25	
Styrene	ND	ug/L	25	
Xylenes (total)	ND	ug/L	25	
Surrogate	Recovery			
Toluene-d8	102	%		
4-Bromofluorobenzene	101	%		
1,2-Dichloroethane-d4	103	%		

J = Result is detected below the reporting limit or is an estimated concentration.
NA = Not Applicable
ND = Not Detected

Reported By: Clifford Merceron

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: 9312071000
 Lab ID: 032087-0003-SA
 Matrix: AQUEOUS

mw - 4

Sampled: 07 DEC 93
 Received: 09 DEC 93
 Authorized: 12 DEC 93

Prepared: NA
 Analyzed: 16 DEC 93

Parameter	Result	Units	Reporting Limit	
Chloromethane	ND	ug/L	10	
Bromomethane	ND	ug/L	10	
tert-Butyl Methyl ether	110	ug/L	5.0	
Vinyl Chloride	ND	ug/L	10	
Chloroethane	ND	ug/L	10	
Methylene chloride	ND	ug/L	5.0	
Acetone	45	ug/L	10	
Carbon disulfide	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	5.0	
1,1-Dichloroethane	ND	ug/L	5.0	
1,2-Dichloroethene (cis/trans)	43	ug/L	5.0	
Chloroform	ND	ug/L	5.0	
1,2-Dichloroethane	ND	ug/L	5.0	
2-Butanone	ND	ug/L	10	
1,1,1-Trichloroethane	ND	ug/L	5.0	
Carbon tetrachloride	ND	ug/L	5.0	
Vinyl Acetate	ND	ug/L	10	
Bromodichloromethane	ND	ug/L	5.0	
1,2-Dichloropropane	ND	ug/L	5.0	
trans-1,3-Dichloropropene	ND	ug/L	5.0	
Trichloroethene	3.4	ug/L	5.0	J
Dibromochloromethane	ND	ug/L	5.0	
1,1,2-Trichloroethane	ND	ug/L	5.0	
Benzene	17	ug/L	5.0	
cis-1,3-Dichloropropene	ND	ug/L	5.0	
Bromoform	ND	ug/L	5.0	
4-Methyl-2-Pentanone	ND	ug/L	10	
2-Hexanone	ND	ug/L	10	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	
Tetrachloroethene	5.2	ug/L	5.0	
Toluene	1.2	ug/L	5.0	J
Chlorobenzene	1.0	ug/L	5.0	J

J = Result is detected below the reporting limit or is an estimated concentration.
 NA = Not Applicable
 ND = Not Detected

Reported By: Clifford Merceron

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240
(cont.)Client Name: H+GCL
Client ID: 9312071000
Lab ID: 032087-0003-SA
Matrix: AQUEOUS

mw - 4

Sampled: 07 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93Prepared: NA
Analyzed: 16 DEC 93

Parameter	Result	Units	Reporting Limit	
Ethylbenzene	ND	ug/L	5.0	
Styrene	ND	ug/L	5.0	
Xylenes (total)	2.6	ug/L	5.0	J
Surrogate	Recovery			
Toluene-d8	100	%		
4-Bromofluorobenzene	101	%		
1,2-Dichloroethane-d4	106	%		

J = Result is detected below the reporting limit or is an estimated concentration.
NA = Not Applicable
ND = Not Detected

Reported By: Clifford Merceron

Approved By: David Ercoliani

Enseco
A Corning Company

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312091245
Lab ID: 032984-0001-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

mw-4d
Sampled: 09 DEC 93
Prepared: 23 DEC 93

Received: 18 DEC 93
Analyzed: 23 DEC 93

Parameter	Result	Units	Reporting Limit	
Acetone	ND	ug/L	20	
Benzene	9.4	ug/L	10	J
Bromodichloromethane	ND	ug/L	10	
Bromoform	ND	ug/L	10	
Bromomethane	ND	ug/L	20	
2-Butanone (MEK)	ND	ug/L	20	
Carbon disulfide	ND	ug/L	10	
Carbon tetrachloride	ND	ug/L	10	
Chlorobenzene	ND	ug/L	10	
Chloroethane	ND	ug/L	20	
Chloroform	5.4	ug/L	10	J
Chloromethane	ND	ug/L	20	
Dibromochloromethane	ND	ug/L	10	
1,1-Dichloroethane	ND	ug/L	10	
1,2-Dichloroethane	ND	ug/L	10	
1,1-Dichloroethene	ND	ug/L	10	
1,2-Dichloroethene				
(total)	270	ug/L	10	
1,2-Dichloropropane	ND	ug/L	10	
cis-1,3-Dichloropropene	ND	ug/L	10	
trans-1,3-Dichloropropene	ND	ug/L	10	
Ethylbenzene	5.2	ug/L	10	J
2-Hexanone	ND	ug/L	20	
tert-Butyl methyl ether	4.1	ug/L	10	J
Methylene chloride	23	ug/L	10	
4-Methyl-2-pentanone				
(MIBK)	ND	ug/L	20	
Styrene	ND	ug/L	10	
1,1,2,2-Tetrachloroethane	ND	ug/L	10	
Tetrachloroethene	52	ug/L	10	
Toluene	19	ug/L	10	
1,1,1-Trichloroethane	ND	ug/L	10	
1,1,2-Trichloroethane	ND	ug/L	10	
Trichloroethene	14	ug/L	10	
Vinyl acetate	ND	ug/L	20	
Vinyl chloride	ND	ug/L	20	
Xylenes (total)	26	ug/L	10	

Surrogate Recovery

Toluene-d8 103 %

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

Enseco
A Chemtec CompanyVolatile Organics
Target Compound List (TCL)
Method 8240Client Name: H+GCL
Client ID: 9312091245
Lab ID: 032984-0001-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

MW-4d

Sampled: 09 DEC 93
Prepared: 23 DEC 93Received: 18 DEC 93
Analyzed: 23 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene	97	%
1,2-Dichloroethane-d4	92	%

Note J : Result is detected below the reporting limit or is an estimated concentration.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Audrey Verniero

Enseco
A Forming Company

TCL Volatile Organics (CONT.)

Method 8240

Client Name: H+GCL
Client ID: 9312130945
Lab ID: 032984-0013-SA
Matrix: WASTE
Authorized: 18 DEC 93

Sampled: 10 DEC 93
Prepared: 24 DEC 93

Received: 18 DEC 93
Analyzed: 24 DEC 93

Surrogate

Recovery

1,2-Dichloroethane-d4

67 %

Note J : Result is detected below the reporting limit or is an
estimated concentration.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Enseco
A Corning Company

TCL Volatile Organics

Method 8240

Client Name: H+GCL
Client ID: 9312130955
Lab ID: 032984-0014-SA
Matrix: WASTE
Authorized: 18 DEC 93

WASTE OIL
Phums 519, 523, 507
Sampled: 10 DEC 93
Prepared: 24 DEC 93
Received: 18 DEC 93
Analyzed: 24 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	mg/kg	10
Bromomethane	ND	mg/kg	10
Vinyl chloride	ND	mg/kg	10
Chloroethane	ND	mg/kg	10
Methylene chloride	7.8	mg/kg	5.0
Acetone	ND	mg/kg	10
Carbon disulfide	ND	mg/kg	5.0
1,1-Dichloroethene	ND	mg/kg	5.0
1,1-Dichloroethane	ND	mg/kg	5.0
1,2-Dichloroethene (cis/trans)	ND	mg/kg	5.0
Chloroform	ND	mg/kg	5.0
1,2-Dichloroethane	ND	mg/kg	5.0
2-Butanone	ND	mg/kg	10
1,1,1-Trichloroethane	ND	mg/kg	5.0
Carbon tetrachloride	ND	mg/kg	5.0
Vinyl acetate	ND	mg/kg	10
Bromodichloromethane	ND	mg/kg	5.0
1,2-Dichloropropane	ND	mg/kg	5.0
cis-1,3-Dichloropropene	ND	mg/kg	5.0
Trichloroethene	ND	mg/kg	5.0
Dibromochloromethane	ND	mg/kg	5.0
1,1,2-Trichloroethane	ND	mg/kg	5.0
Benzene	2.5	mg/kg	5.0
trans-1,3-Dichloropropene	ND	mg/kg	5.0
Bromoform	ND	mg/kg	5.0
4-Methyl-2-pentanone	ND	mg/kg	10
2-Hexanone	ND	mg/kg	10
1,1,2,2-Tetrachloroethane	ND	mg/kg	5.0
Tetrachloroethene	ND	mg/kg	5.0
Toluene	160	mg/kg	5.0
Chlorobenzene	ND	mg/kg	5.0
Ethylbenzene	15	mg/kg	5.0
Styrene	ND	mg/kg	5.0
Xylenes (total)	49	mg/kg	5.0
tert-Butyl methyl ether	ND	mg/kg	5.0

Surrogate Recovery

Toluene-d8	ND	%
4-Bromofluorobenzene	ND	%

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

Enseco
A Caring Company

TCL Volatile Organics (CONT.)

Method 8240

Client Name: H+GCL
Client ID: 9312130955
Lab ID: 032984-0014-SA
Matrix: WASTE
Authorized: 18 DEC 93

Sampled: 10 DEC 93
Prepared: 24 DEC 93

Received: 18 DEC 93
Analyzed: 24 DEC 93

Surrogate

Recovery

1,2-Dichloroethane-d4

ND %

Note J : Result is detected below the reporting limit or is an
estimated concentration.

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

INFILTRATION GALLERY



TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: 9312110950
 Lab ID: 032164-0010-SA
 Matrix: SOIL

IG Soil #1

Sampled: 11 DEC 93
 Received: 14 DEC 93
 Authorized: 14 DEC 93
 Prepared: NA
 Analyzed: 23 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Chloromethane	ND	ug/kg	15
Bromomethane	ND	ug/kg	15
Vinyl Chloride	ND	ug/kg	15
Chloroethane	ND	ug/kg	15
Methylene chloride	ND	ug/kg	7.3
Acetone	ND	ug/kg	15
Carbon disulfide	ND	ug/kg	7.3
1,1-Dichloroethene	ND	ug/kg	7.3
1,1-Dichloroethane	ND	ug/kg	7.3
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	7.3
Chloroform	ND	ug/kg	7.3
1,2-Dichloroethane	ND	ug/kg	7.3
2-Butanone	ND	ug/kg	15
1,1,1-Trichloroethane	ND	ug/kg	7.3
Carbon tetrachloride	ND	ug/kg	7.3
Vinyl Acetate	ND	ug/kg	15
Bromodichloromethane	ND	ug/kg	7.3
1,2-Dichloropropane	ND	ug/kg	7.3
cis-1,3-Dichloropropene	ND	ug/kg	7.3
Trichloroethene	ND	ug/kg	7.3
Dibromochloromethane	ND	ug/kg	7.3
1,1,2-Trichloroethane	ND	ug/kg	7.3
Benzene	ND	ug/kg	7.3
trans-1,3-Dichloropropene	ND	ug/kg	7.3
Bromoform	ND	ug/kg	7.3
4-Methyl-2-Pentanone	ND	ug/kg	15
2-Hexanone	ND	ug/kg	15
1,1,2,2-Tetrachloroethane	ND	ug/kg	7.3
Tetrachloroethene	ND	ug/kg	7.3
Toluene	ND	ug/kg	7.3
Chlorobenzene	ND	ug/kg	7.3
Ethylbenzene	ND	ug/kg	7.3
Styrene	ND	ug/kg	7.3

Percent moisture is 31%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240
(cont.)Client Name: H+GCL
Client ID: 9312110950
Lab ID: 032164-0010-SA
Matrix: SOILSampled: 11 DEC 93
Received: 14 DEC 93
Authorized: 14 DEC 93
Prepared: NA
Analyzed: 23 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Xylenes (total)	ND	ug/kg	7.3
Surrogate	Recovery		
1,2-Dichloroethane-d4	96	%	
Toluene-d8	107	%	
4-Bromofluorobenzene	87	%	

Percent moisture is 31%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: 9312111025
 Lab ID: 032164-0011-SA
 Matrix: SOIL

IG SOIL # 2
 Sampled: 11 DEC 93
 Received: 14 DEC 93
 Authorized: 14 DEC 93
 Prepared: NA
 Analyzed: 24 DEC 93

Parameter	Result	Units	Limit
Chloromethane	ND	ug/kg	14
Bromomethane	ND	ug/kg	14
Vinyl Chloride	ND	ug/kg	14
Chloroethane	ND	ug/kg	14
Methylene chloride	ND	ug/kg	7.0
Acetone	ND	ug/kg	14
Carbon disulfide	ND	ug/kg	7.0
1,1-Dichloroethene	ND	ug/kg	7.0
1,1-Dichloroethane	ND	ug/kg	7.0
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	7.0
Chloroform	ND	ug/kg	7.0
1,2-Dichloroethane	ND	ug/kg	7.0
2-Butanone	ND	ug/kg	14
1,1,1-Trichloroethane	ND	ug/kg	7.0
Carbon tetrachloride	ND	ug/kg	7.0
Vinyl Acetate	ND	ug/kg	14
Bromodichloromethane	ND	ug/kg	7.0
1,2-Dichloropropane	ND	ug/kg	7.0
cis-1,3-Dichloropropene	ND	ug/kg	7.0
Trichloroethene	ND	ug/kg	7.0
Dibromochloromethane	ND	ug/kg	7.0
1,1,2-Trichloroethane	ND	ug/kg	7.0
Benzene	ND	ug/kg	7.0
trans-1,3-Dichloropropene	ND	ug/kg	7.0
Bromoform	ND	ug/kg	7.0
4-Methyl-2-Pentanone	ND	ug/kg	14
2-Hexanone	ND	ug/kg	14
1,1,2,2-Tetrachloroethane	ND	ug/kg	7.0
Tetrachloroethene	ND	ug/kg	7.0
Toluene	ND	ug/kg	7.0
Chlorobenzene	ND	ug/kg	7.0
Ethylbenzene	ND	ug/kg	7.0
Styrene	ND	ug/kg	7.0

Percent moisture is 29%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240
(cont.)

Client Name: H+GCL
Client ID: 9312111025
Lab ID: 032164-0011-SA
Matrix: SOIL

Sampled: 11 DEC 93
Received: 14 DEC 93
Authorized: 14 DEC 93
Prepared: NA
Analyzed: 24 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Xylenes (total)	ND	ug/kg	7.0
Surrogate	Recovery		
1,2-Dichloroethane-d4	103	%	
Toluene-d8	105	%	
4-Bromofluorobenzene	99	%	

Percent moisture is 29%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

IG SOIL #3

Client Name: H+GCL
 Client ID: 9312111100
 Lab ID: 032164-0012-SA
 Matrix: SOIL

Sampled: 11 DEC 93
 Received: 14 DEC 93
 Authorized: 14 DEC 93
 Prepared: NA
 Analyzed: 24 DEC 93

Parameter	Result	DRY WEIGHT Reporting Units	Limit
Chloromethane	ND	ug/kg	13
Bromomethane	ND	ug/kg	13
Vinyl Chloride	ND	ug/kg	13
Chloroethane	ND	ug/kg	13
Methylene chloride	ND	ug/kg	6.4
Acetone	ND	ug/kg	13
Carbon disulfide	ND	ug/kg	6.4
1,1-Dichloroethene	ND	ug/kg	6.4
1,1-Dichloroethane	ND	ug/kg	6.4
1,2-Dichloroethene (cis/trans)	ND	ug/kg	6.4
Chloroform	ND	ug/kg	6.4
1,2-Dichloroethane	ND	ug/kg	6.4
2-Butanone	ND	ug/kg	13
1,1,1-Trichloroethane	ND	ug/kg	6.4
Carbon tetrachloride	ND	ug/kg	6.4
Vinyl Acetate	ND	ug/kg	13
Bromodichloromethane	ND	ug/kg	6.4
1,2-Dichloropropane	ND	ug/kg	6.4
cis-1,3-Dichloropropene	ND	ug/kg	6.4
Trichloroethene	ND	ug/kg	6.4
Dibromochloromethane	ND	ug/kg	6.4
1,1,2-Trichloroethane	ND	ug/kg	6.4
Benzene	ND	ug/kg	6.4
trans-1,3-Dichloropropene	ND	ug/kg	6.4
Bromoform	ND	ug/kg	6.4
4-Methyl-2-Pentanone	ND	ug/kg	13
2-Hexanone	ND	ug/kg	13
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.4
Tetrachloroethene	ND	ug/kg	6.4
Toluene	ND	ug/kg	6.4
Chlorobenzene	ND	ug/kg	6.4
Ethylbenzene	ND	ug/kg	6.4
Styrene	ND	ug/kg	6.4

Percent moisture is 22%. All results and limits are reported on a dry weight basis.

NA = Not Applicable

ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240
(cont.)Client Name: H+GCL
Client ID: 9312111100
Lab ID: 032164-0012-SA
Matrix: SOILSampled: 11 DEC 93
Received: 14 DEC 93
Authorized: 14 DEC 93
Prepared: NA
Analyzed: 24 DEC 93

Parameter	Result	DRY WEIGHT Reporting Units	Limit
Xylenes (total)	ND	ug/kg	6.4
Surrogate	Recovery		
1,2-Dichloroethane-d4	105	%	
Toluene-d8	105	%	
4-Bromofluorobenzene	101	%	

Percent moisture is 22%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

Client Name: H+GCL
Client ID: 9312111135
Lab ID: 032164-0013-SA
Matrix: SOIL

IG Soil #4
Sampled: 11 DEC 93
Received: 14 DEC 93
Authorized: 14 DEC 93
Prepared: NA
Analyzed: 24 DEC 93

Parameter	Result	DRY WEIGHT Units	Reporting Limit
Chloromethane	ND	ug/kg	14
Bromomethane	ND	ug/kg	14
Vinyl Chloride	ND	ug/kg	14
Chloroethane	ND	ug/kg	14
Methylene chloride	ND	ug/kg	6.9
Acetone	ND	ug/kg	14
Carbon disulfide	ND	ug/kg	6.9
1,1-Dichloroethene	ND	ug/kg	6.9
1,1-Dichloroethane	ND	ug/kg	6.9
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	6.9
Chloroform	ND	ug/kg	6.9
1,2-Dichloroethane	ND	ug/kg	6.9
2-Butanone	ND	ug/kg	14
1,1,1-Trichloroethane	ND	ug/kg	6.9
Carbon tetrachloride	ND	ug/kg	6.9
Vinyl Acetate	ND	ug/kg	14
Bromodichloromethane	ND	ug/kg	6.9
1,2-Dichloropropane	ND	ug/kg	6.9
cis-1,3-Dichloropropene	ND	ug/kg	6.9
Trichloroethene	ND	ug/kg	6.9
Dibromochloromethane	ND	ug/kg	6.9
1,1,2-Trichloroethane	ND	ug/kg	6.9
Benzene	ND	ug/kg	6.9
trans-1,3-Dichloropropene	ND	ug/kg	6.9
Bromoform	ND	ug/kg	6.9
4-Methyl-2-Pentanone	ND	ug/kg	14
2-Hexanone	ND	ug/kg	14
1,1,2,2-Tetrachloroethane	ND	ug/kg	6.9
Tetrachloroethene	ND	ug/kg	6.9
Toluene	ND	ug/kg	6.9
Chlorobenzene	ND	ug/kg	6.9
Ethylbenzene	ND	ug/kg	6.9
Styrene	ND	ug/kg	6.9

Percent moisture is 27%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240
(cont.)

Client Name: H+GCL
Client ID: 9312111135
Lab ID: 032164-0013-SA
Matrix: SOIL

Sampled: 11 DEC 93
Received: 14 DEC 93
Authorized: 14 DEC 93
Prepared: NA
Analyzed: 24 DEC 93

Parameter	Result	DRY WEIGHT Reporting	
		Units	Limit
Xylenes (total)	ND	ug/kg	6.9
Surrogate	Recovery		
1,2-Dichloroethane-d4	101	%	
Toluene-d8	108	%	
4-Bromofluorobenzene	92	%	

Percent moisture is 27%. All results and limits are reported on a dry weight basis.

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: David Ercoliani

MW-3 (Nitrates)

General Chemistry



Client Name: H+GCL
Client ID: 9312131420
Lab ID: 032164-0021-SA
Matrix: AQUEOUS

Sampled: 10 DEC 93
Received: 14 DEC 93
Authorized: 14 DEC 93

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Nitrate plus Nitrite as N	0.38	mg/L	0.050	353.2	NA	15 DEC 93

NA = Not Applicable

Reported By: Neena Patel

Approved By: Joasia Przyluska

Appendix I — Laboratory Analytical QA/QC Data Sheets, Texaco Tutu, December 1993



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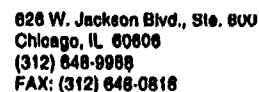
Chain of Custody

Date 11/30/93 Page 1 of 1

Lab Name <u>Ennaco East</u> Address <u>2200 Cottontail Lane</u> <u>Somerset NJ 08873</u> Telephone <u>(908) 469-5800</u>			Analysis Request																									
Sample Number	Matrix	Location	Halogenated Volatiles 821.010	Aromatic Volatiles 820.020	Phenols, Sub Phenols 820.040	Pesticides/PCB 820.080	Polynuclear Aromatic Hydrocarbons 810.010	Volatile Compounds 820.020	Base/Neutral Acid Compounds 820.020	Total Organic Carbon (TOC) 815.000	Total Organic Halogens (TOH) 820.0	Petroleum Hydrocarbons 418.1	TPH/HTX Modified 8015	TPH-Vol. Semi-Vol. Hydrocarbons, Petroleum 820.020	TPH-Vol. Semi-Vol. Hydrocarbons, Petroleum 820.020	PCPA Metals 820.020	Priority Pollutant Metals (P) 820.020	CAM Metals (M) 820.020	TLG/STLC	Fluoride	Compliance	Residue	Oil & Grease	Cyanide Total/Ambient	Chemical Oxygen Demand (COD)	Biological Oxygen Demand (BOD)	Number of Containers	
9311301054	Soil	SB-2(3')																										2
9311301144	Soil	SB-2(5')																										2
9311301235	H ₂ O	TEXACO Turb																										3
9311301240	H ₂ O	TEXACO Turb																										3
9311301355	Soil	SB-3(3')																										2
9311301505	Soil	SB-3(5')																										2
9311301630	Soil	SB-1(3')																										2
9311301710	Soil	SB-1(5')																										2
9311301830	H ₂ O	TEXACO Turb																										3

Project Information		Sample Receipt		Relinquished By		Relinquished By		Relinquished By	
Project <u>TEXACO Turb</u>	Total No. of Containers	Relinquished By <u>Pat Montano 1400</u>		1. Relinquished By		2. Relinquished By		3. Relinquished By	
Project Director <u>Dubyk</u>	Chain of Custody Seals	Signature <u>Pat Montano</u> (Time) <u>12-2-93</u>		Signature		Signature		Signature	
Large Code No. <u>5417302</u>	Rec'd Good Condition/Good	Printed Name <u>Pat Montano</u> (Date)		Printed Name		Printed Name		Printed Name	
Shipping ID. No. <u>400-3003-2122</u>	Conforms to Record	Company <u>H+GCL</u>		Company		Company		Company	
Via <u>FOO X</u>	Lab No.	Received By		1. Received By		2. Received By (Laboratory)		3. Received By (Laboratory)	
Special Instructions/Comments: <u>STANDARD TAT</u>		Signature		Signature		Signature		Signature	
		Printed Name		Printed Name		Printed Name		Printed Name	
		Company		Company		Company		Company	

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Date 12-1-93 Page 1 Of 1

TUT 005 1583



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Chain of Custody

Date 12-2-93 Page 1 of 1

Lab Name Enseco-East

Address 2200 Cottontail Lane

Somerset NJ 08873

Telephone (908) 469-5800

Analysts (SIGNATURES)

At Martins

Analysis Request

Lab Name <u>ENRCHO - E&E</u>			Halogenated Volatiles 601/6010	Aromatic Volatiles 602/6020	Phenols, Sub Phenols 604/6040	Pesticides/PCB 606/6060	Polynuclear Aromatic Hydrocarbons 610/6100	Volatile Compounds GC/MS 624/6240	Base/Neut/Acid Compounds GC/MS 625/6270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOH) 9020	Petroleum Hydrocarbons 418.1 TPH/STEX	Modified 8015	TCLP- Vol. Semi-Vol. Herbicides, Pesticides	TCLP- Metals	RCRA Metals (9)	Priority Pollutant Metals (13)	CAM Metals (18) TLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Ammiable	Chemical Oxygen Demand (COD)	<u>624/6240 + 107BET</u> <u>14 Jones</u>	Number of Containers
Address <u>2200 Cottontail Lane</u>																										
<u>Somerset NJ 08873</u>																										
Telephone <u>(908)469-5800</u>																										
Analysts (SIGNATURES) <u>at Madonia,</u>																										
Sample Number	Matrix	Location																								
9312020905	Soil	TT-4																						X	2	
9312020910	Soil	TT-4																						X	2	
9312021045	Soil	SB-4																						X	2	
9312021050	Soil	SB-4																						X	2	
9312021235	Soil	IG/SB-2																						X	2	

Project Information		Sample Receipt		Relinquished By		1. Relinquished By		2. Relinquished By		3. Relinquished By	
Project <u>TEXACO TURN</u>		Total No. of Containers		<i>Patrick Martins</i> 1/4/00		(Signature) (Time)		(Signature) (Time)		(Signature) (Time)	
Project Director <u>QUAYE</u>		Chain of Custody Seals		<i>Patrick Martins</i> 12/2/93		(Signature) (Time)		(Signature) (Time)		(Signature) (Time)	
Charge Code No. <u>34173.02</u>		Rec'd Good Condition/Cold		<i>H*GCL</i>		(Signature) (Time)		(Signature) (Time)		(Signature) (Time)	
Shipping ID. No.		Conforms to Record		(Company)		(Signature) (Time)		(Signature) (Time)		(Signature) (Time)	
<u>400-3003-2122</u>		Lab No.		Received By		1. Received By		2. Received By (Laboratory)		3. Received By (Laboratory)	
In <u>FED X</u>				(Signature) (Time)		(Signature) (Time)		(Signature) (Time)		(Signature) (Time)	
Special Instructions/Comments:				(Printed Name) (Date)		(Printed Name) (Date)		(Printed Name) (Date)		(Printed Name) (Date)	
<u>STANDARD TAT</u>				(Company)		(Company)		(Company)		(Company)	

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Chain of Custody

Date 12-3-93 Page 1 Of 1

Lab Name <u>Enasco East</u> Address <u>2200 Cottontail Lane</u> <u>Somerset NJ 08873</u> Telephone <u>(908) 469-5800</u>			Analysis Request																											
Sample Number	Matrix	Location	Halogenated Volatiles 601/6010	Aromatic Volatiles 602/6020	Phenols, Sub Phenols 604/6040	Pesticides/PCB 608/6080	Polynuclear Aromatic Hydrocarbons 610/6310	Volatile Compounds GC/MS 624/6240	Base/Neu/Acid Compounds GC/MS 625/6270	Total Organic Carbon (TOC) 415/5060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX Modified 8015	TCLP - Vol., Semi-Vol. Hydrocarbons, Pesticides	TCLP - Metals	PCRA Metals (6)	Priority Pollutant Metals (15)	CAM Metals (18) TLLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	B240 + M126 + Xylenes	Number of Containers				
9312030800	H ₂ O	TEXACO																							/	2				
9312031215	SOIL	TT-5																							/	2				
9312031220	SOIL	TT-5																							/	2				
9312041000	SOIL	OW/SB-1																							/	2				
9312041100	SOIL	TT-2																							/	2				
9312041130	SOIL	TT-2																							/	1				
9312041320	SOIL	SB-5																							/	2				
9312041550	SOIL	SB-6																							/	2				
9312041555	SOIL	SB-6																							/	2				

Project Information		Sample Receipt		Relinquished By		Relinquished By		Relinquished By	
Project <u>TEXACO Tutu</u>	Total No. of Containers	Relinquished By <u>[Signature]</u> <u>0955</u>		1. Relinquished By		2. Relinquished By		3. Relinquished By	
Project Director <u>PURBYK</u>	Chain of Custody Seals	(Signature) <u>PAT MONTANO</u> <u>12/3/93</u>		(Signature)		(Signature)		(Signature)	
Charge Code No. <u>5413.02</u>	Rec'd Good Condition/Cold	(Printed Name) <u>PAT MONTANO</u> <u>12/6/93</u>		(Printed Name)		(Printed Name)		(Printed Name)	
Shipping ID. No. <u>400-3003-2133</u>	Conforms to Record	(Company) <u>H*GCL</u>		(Company)		(Company)		(Company)	
Via <u>FED X</u>	Lab No.	Received By		1. Received By		2. Received By (Laboratory)		3. Received By (Laboratory)	
Special Instructions/Comments: <u>STANDARD TAT</u>		(Signature)		(Signature)		(Signature)		(Signature)	
		(Printed Name)		(Printed Name)		(Printed Name)		(Printed Name)	
		(Company)		(Company)		(Company)		(Company)	



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Chain of Custody

Date 12-7-93 Page 1 of 2

Lab Name <u>Enseco East</u> Address <u>2200 Cottontail Lane</u> <u>Somerset NJ 08873</u> Telephone <u>(908) 469-5800</u>			Analysis Request																								
Sample Number	Matrix	Location	Halogenated Volatiles 801/8010	Aromatic Volatiles 602/6020	Phenols, Sub Phenols 604/6040	Pesticides/PCB 608/6080	Polynuclear Aromatic Hydrocarbons 610/610	Volatile Compounds 624/6240	Base/Neutral/Acid Compounds 625/6250	Total Organic Carbon (TOC) 415/9060	Total Organic Halogides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/HTX Modified 8015	TCLP, Vol, Semi-Vol, Herbicides, Pesticides	TCLP, Metals	PCRA Metals (8)	Priority Pollutant Metals (13)	CAM Metals (18) TLO/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Ammunite	Chemical Oxygen Demand (COD)	<u>6240 + 610/610</u> <u>624/6240</u>	Number of Containers	
9312070745	H ₂ O	TEXACO																								1	3
9312021433	SOIL	ESSO																								1	1
9312071000	H₂O	MW-4																								1	1
9312071000	H ₂ O	MW-4																								1	3
9312071030	SOIL	TT-1d																								1	2
9312071033	SOIL	TT-1d																								1	2
9312071110	H ₂ O	TEXACO																								1	3
9312071115	H ₂ O	TEXACO																								1	3
9312071140	SOIL	TT-1d																								1	2
9312071430	H ₂ O	MW-3																								1	3

Project Information		Sample Receipt		Relinquished By		Relinquished By		Relinquished By	
Project	Project Director	Total No. of Containers	Chain of Custody Seals	Signature	Date	Signature	Date	Signature	Date
TEXACO Tolu	12/8/93			<u>Pat Mountain</u>	<u>12/8/93</u>				
Charge Code No.	54193.02	Rec'd Good Condition/Cold							
Shipping ID. No.	400-3003-2144	Conforms to Record							
Via	FED X	Lab No.							
Special Instructions/Comments:				Received By		Received By		Received By	
				Signature	Date	Signature	Date	Signature	Date
				(Printed Name)	(Date)	(Printed Name)	(Date)	(Printed Name)	(Date)
				(Company)		(Company)		(Company)	



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Chain of Custody

Date 12-8-93 Page 2 of 2

Lab Name <u>Enseco East</u> Address <u>2200 Cottontail Lane</u> <u>Somerset NJ 08873</u> Telephone <u>(908) 469-5800</u>			Analysis Request																								
Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 606/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neutral Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOH) 9020	Petroleum Hydrocarbons 418.1	TPH/STEX Modified 8015	TCUP: Vol. Semi-Vol. Herbicides, Pesticides	TCUP: Metals	PCRA Metals(8)	Priority Pollutant Metals (13)	CAM Metals (18) ITL/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	<u>BZUO + mTSE + x4/1000</u>	Number of Containers	
4312080930	Soil	TT-1																								1	2
4312080935	Soil	TT-1																								1	2
4312080940	Soil	TT-1																								1	2
Project Information			Sample Receipt		Relinquished By 1.										Relinquished By 2.					Relinquished By 3.							
Project <u>TEXACO TITUL</u>			Total No. of Containers		<u>1200</u>																						
Project Director <u>DAVID K</u>			Chain of Custody Seals		<u>DAVID MURTIUGO 12/8/93</u>																						
Charge Code No. <u>54133.02</u>			Rec'd Good Condition/Cold		<u>H*GCL</u>																						
Shipping ID. No. <u>400-3003-2144</u>			Conforms to Record		(Company)										(Company)					(Company)							
Via <u>FED X</u>			Lab No.		Received By 1.										Received By 2.					Received By (Laboratory) 3.							
Special Instructions/Comments: <u>STANDARD TAT</u>					(Signature)										(Signature)					(Signature)							
					(Time)										(Time)					(Time)							
					(Printed Name)										(Printed Name)					(Printed Name)							
					(Date)										(Date)					(Date)							
					(Company)										(Company)					(Company)							



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Chain of Custody

Date 12-9-93 Page 1 Of 1

Lab Name <u>Enseco East</u> Address <u>2200 Cottontail Lane</u> <u>Somerset NJ 08873</u> Telephone <u>(908) 469-5800</u>			Analysis Request																									
Samplers (SIGNATURES) <u>[Signature]</u>			Halogenated Volatiles 801/8010	Aromatic Volatiles 802/8020	Phenols, Sub Phenols 804/8040	Pesticides/PCB 808/8080	Polynuclear Aromatic Hydrocarbons 610/6310	Volatile Compounds GC/MS 624/6240	Base/Neu/Acid Compounds GC/MS 625/6270	Total Organic Carbon (TOC) 415/9080	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/BTEX	Modified 8015	TCDF, Vol., Semi-Vol. Herbicides, Pesticides	TCDF, Metals	PCPA Metals(6)	Priority Pollutant Metals (13)	CAM Metals (18) TLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Aminable	Chemical Oxygen Demand (COD)	8240+MTBE + 14 KHS	Number of Containers	
Sample Number	Matrix	Location																										
9312091245	H ₂ O	MW-4d	Invest.																									
9312100740	H ₂ O	TEXACO	TRIP BLANK																									
9312100905	H ₂ O	TT-3d	Invest.																									
9312101010	H ₂ O	TT-5	Invest.																									
9312101115	H ₂ O	TT-2	Invest.																									
9312101230	H ₂ O	TT-4	Invest.																									
9312101415	H ₂ O	TT-1d	Invest.																									
9312101540	H ₂ O	TT-1	Invest.																									
9312101545	H ₂ O	TT-11	Dup of 1540																									

Project Information		Sample Receipt		Relinquished By		1. Relinquished By		2. Relinquished By		3. Relinquished By		
Project <u>TEXACO TATA</u>	Total No. of Containers			<u>[Signature]</u>	<u>1200</u>	(Time)	(Signature)	(Time)	(Signature)	(Time)	(Signature)	(Time)
Project Director <u>DURLEY</u>	Chain of Custody Seals			<u>[Signature]</u>	<u>12/13/93</u>	(Date)	(Printed Name)	(Date)	(Printed Name)	(Date)	(Printed Name)	(Date)
Charge Code No. <u>54173.02</u>	Rec'd Good Condition/Cold			<u>H*GCL</u>		(Company)	(Company)					
Shipping ID. No. <u>400-3003-2166</u>	Conforms to Record			Received By	1.	Received By	2.	Received By (Laboratory)	3.			
Via: <u>FEU X</u>	Lab No.			(Signature)	(Time)	(Signature)	(Time)	(Signature)	(Time)			
Special Instructions/Comments:				(Printed Name)	(Date)	(Printed Name)	(Date)	(Printed Name)	(Date)			
				(Company)		(Company)		(Laboratory)				



Albuquerque
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102
(505) 842-0001
FAX: (505) 842-0595

NASA-WSTF
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Las Cruces, NM 88004
(505) 524-5353
FAX: (505) 524-5315

Boston
180 Canal Street
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(617) 723-4664
FAX: (617) 367-1386

Chicago
626 W. Jackson Blvd., Ste. 800
Chicago, IL 60606
(312) 648-9888
FAX: (312) 648-0818

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Hartford
380 South Center Street
Windsor Locks, CT 06098
(203) 627-6528
FAX: (203) 627-7815

Los Angeles
19600 Fairchild, Ste. 120
Irvine, CA 92715
(714) 955-0201
FAX: (714) 955-0965

Mid Atlantic Region
4221 Forbes Blvd., Ste. 240
Lanham, MD 20708-4325
(301) 459-9677
FAX: (301) 459-3064

New York
261 Madison Avenue
New York, NY 10018
(212) 983-8510
FAX: (212) 983-8795

San Francisco
2200 Powell Street, Ste. 880
Emeryville, CA 94608
(510) 547-3686
FAX: (510) 547-3631

Chain of Custody

Date 12-11-93 Page 1 of 1

Lab Name <u>Enseco East</u> Address <u>2200 Cottontail Lane</u> <u>Somerset NJ 08873</u> Telephone <u>(908) 469-5800</u>			Analysis Request																									
Sample Number	Matrix	Location	Halogenated Volatiles 601/6010	Aromatic Volatiles 602/6020	Phenols, Sub Phenols 604/6040	Pesticides/PCB 608/6080	Polynuclear Aromatic Hydrocarbons 610/6310	Volatile Compounds GC/MS 624/6240	Base/Neutral/Acid Compounds GC/MS 625/6270	Total Organic Carbon (TOC) 415/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/STEX Modified 8015	TCLP, Vol., Semi-Vol. Hydrocarbons, Pesticides	TCLP, Metals	RCRA Metals (6)	Priority Pollutant Metals (13)	CAM Metals (18)	TLG/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	8240 (VOA)	8240 + MTBE + Xylenes	Number of Containers
9312110950	SOIL	TEXACO	Invest. split sample from ARL Inf. R. Gallery Bottom																									
9312111025	SOIL	TEXACO	"																									
9312111100	SOIL	TEXACO	"																									
9312111135	SOIL	TEXACO	"																									
9312111130	H ₂ O	TT-6	Invest. Collected by H*GCL from well TT-6 (Four Wands)																									
9312111645	H ₂ O	TEXACO	Waste Water tank #1																									
9312111650	H ₂ O	TEXACO	Waste Water tank #2																									
Project Information			Sample Receipt		Relinquished By		1. Relinquished By		2. Relinquished By		3. Relinquished By																	
Project <u>TEXACO TITAN</u>			Total No. of Containers		<u>[Signature]</u> <u>1200</u>		<u>[Signature]</u> <u>1200</u>		<u>[Signature]</u> <u>1200</u>		<u>[Signature]</u> <u>1200</u>																	
Project Director <u>Dubyle</u>			Chain of Custody Seals		<u>[Signature]</u> <u>12/13/93</u>		<u>[Signature]</u> <u>12/13/93</u>		<u>[Signature]</u> <u>12/13/93</u>		<u>[Signature]</u> <u>12/13/93</u>																	
Charge Code No. <u>54173.01</u>			Rec'd Good Condition/Cold		<u>[Signature]</u>		<u>[Signature]</u>		<u>[Signature]</u>		<u>[Signature]</u>																	
Shipping ID. No. <u>400-3003-2166</u>			Conforms to Record		<u>[Signature]</u>		<u>[Signature]</u>		<u>[Signature]</u>		<u>[Signature]</u>																	
Via: <u>FED X</u>			Lab No.		<u>[Signature]</u>		<u>[Signature]</u>		<u>[Signature]</u>		<u>[Signature]</u>																	
Special Instructions/Comments: <u>* Request 14 day + AT</u>					<u>[Signature]</u>		<u>[Signature]</u>		<u>[Signature]</u>		<u>[Signature]</u>																	



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San Francisco
2200 Powell Street, Ste. 880
Emeryville, CA 94608
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FAX: (510) 547-3631

Chain of Custody

Date 12-13-73 Page 1 of 1

Lab Name <u>Ensco East</u> Address <u>2200 Cottontail Lane</u> <u>Somerset NJ 08873</u> Telephone <u>(908) 469-5800</u>			Analysis Request																										
Sample Number	Matrix	Location	Halogenated Volatiles 801/8010	Aromatic Volatiles 602/8020	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/8310	Volatile Compounds GC/MS 624/8240	Base/Neutral/Acid Compounds GC/MS 625/8270	Total Organic Carbon (TOC) 415/8060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH/STEX	Modified 8015	TCLP - Vol., Semi-Vol. Herbicides, Pesticides	TCLP - Metals	RCRA Metals (8)	Priority Pollutant Metals (13)	CAM Metals (18) TTLG/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Arsenite	Chemical Oxygen Demand (COD)	VOC's (8240)	Nitrates/Nitrite	Number of Containers	
9312130945	oil	TEXACO	Invent (Drum # 544)																										3
* 9312130955	oil	TEXACO	Invest. Composite (Drums # 519, 523)																										9
9312131010	oil	TEXACO	Invest (Drum # 534)																										3
9312131040	oil	TEXACO	Invest (Drum # 513)																										3
9312131420	H ₂ O	TEXACO	Invest. Split MW. 3																										1
Project Information			Sample Receipt		Relinquished By		1. Relinquished By		2. Relinquished By		3. Relinquished By																		
Project <u>TEXACO Tutu</u>			Total No. of Containers		<u>Pat Montana</u> 1450		(Signature) (Time)		(Signature) (Time)		(Signature) (Time)																		
Project Director <u>Dubyle</u>			Chain of Custody Seals		<u>Pat Montana</u> 12/13/73		(Signature) (Date)		(Signature) (Date)		(Signature) (Date)																		
Charge Code No. <u>54173.02</u>			Rec'd Good Condition/Cold		<u>H+GCL</u>		(Printed Name) (Date)		(Printed Name) (Date)		(Printed Name) (Date)																		
Shipping ID. No.			Conforms to Record		(Company)		(Company)		(Company)		(Company)																		
<u>400-3003-2166</u>			Lab No.		Received By		1. Received By		2. Received By (Laboratory)		3. Received By (Laboratory)																		
Via: <u>FE 1 X</u>					(Signature)		(Signature)		(Signature)		(Signature)																		
Special Instructions/Comments:					(Printed Name)		(Printed Name)		(Printed Name)		(Printed Name)																		
<u>* 4-40 ml. VOA provided. Please composite</u>					(Company)		(Company)		(Company)		(Company)																		
<u>3-Sets of 3 at Lab for single analysis</u>																													

H*GCL QA/QC SAMPLES

TCL Volatile Organics

Method 8240

9311301235

QA
 HAND AUGER BUCKET
 RINSATE

 Client Name: H+GCL
 Client ID: TEXACO TUTU
 Lab ID: 031950-0003-SA
 Matrix: AQUEOUS

 Sampled: 30 NOV 93
 Received: 03 DEC 93
 Authorized: 05 DEC 93

 Prepared: NA
 Analyzed: 09 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	10
Bromomethane	ND	ug/L	10
tert-Butyl Methyl ether	ND	ug/L	5.0
Vinyl Chloride	ND	ug/L	10
Chloroethane	ND	ug/L	10
Methylene chloride	ND	ug/L	5.0
Acetone	2.8	ug/L	10
Carbon disulfide	4.2	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethene (cis/ trans)	ND	ug/L	5.0
Chloroform	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
2-Butanone	ND	ug/L	10
1,1,1-Trichloroethane	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Vinyl Acetate	ND	ug/L	10
Bromodichloromethane	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Benzene	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
4-Methyl-2-Pentanone	ND	ug/L	10
2-Hexanone	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0

 J
 J

 J = Result is detected below the reporting limit or is an estimated concentration.
 NA = Not Applicable
 ND = Not Detected

Reported By: Kelvin Wang

Approved By: Dennis Flynn

TCL Volatile Organics

Client Name: H+GCL
 Client ID: TEXACO TUTU
 Lab ID: 031950-0003-SA
 Matrix: AQUEOUS

Method 8240
 (cont.)
 #9311301235
 Sampled: 30 NOV 93
 Received: 03 DEC 93
 Authorized: 05 DEC 93

QA
 HAND AUGER BUCKET
 RINSEATE

Prepared: NA
 Analyzed: 09 DEC 93

Parameter	Result	Units	Reporting Limit
Ethylbenzene	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	Recovery		
Toluene-d8	97	%	
4-Bromofluorobenzene	90	%	
1,2-Dichloroethane-d4	100	%	

NA = Not Applicable
 ND = Not Detected

Reported By: Kelvin Wang

Approved By: Dennis Flynn

TCL Volatile Organics

Method 8240

#9311301240

QA
FIELD BLANK

Client Name: H+GCL
Client ID: TEXACO TUTU
Lab ID: 031950-0004-SA
Matrix: AQUEOUS

Sampled: 30 NOV 93
Received: 03 DEC 93
Authorized: 05 DEC 93

Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	10
Bromomethane	ND	ug/L	10
tert-Butyl Methyl ether	ND	ug/L	5.0
Vinyl Chloride	ND	ug/L	10
Chloroethane	ND	ug/L	10
Methylene chloride	ND	ug/L	5.0
Acetone	ND	ug/L	10
Carbon disulfide	1.6	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/L	5.0
Chloroform	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
2-Butanone	ND	ug/L	10
1,1,1-Trichloroethane	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Vinyl Acetate	ND	ug/L	10
Bromodichloromethane	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Benzene	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
4-Methyl-2-Pentanone	ND	ug/L	10
2-Hexanone	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0

J = Result is detected below the reporting limit or is an estimated concentration.

NA = Not Applicable

ND = Not Detected

Reported By: Kelvin Wang

Approved By: Dennis Flynn

TCL Volatile Organics

Client Name: H+GCL
 Client ID: TEXACO TUTU
 Lab ID: 031950-0004-SA
 Matrix: AQUEOUS

Method 8240
 (cont.)

#9311301240

Sampled: 30 NOV 93
 Received: 03 DEC 93
 Authorized: 05 DEC 93

QA
 FIELD BLANK

Prepared: NA
 Analyzed: 09 DEC 93

Parameter	Result	Units	Reporting Limit
Ethylbenzene	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	Recovery		
Toluene-d8	98	%	
4-Bromofluorobenzene	94	%	
1,2-Dichloroethane-d4	105	%	

NA = Not Applicable
 ND = Not Detected

Reported By: Kelvin Wang

Approved By: Dennis Flynn

TCL Volatile Organics
Method 8240
#9311301830
QA
TRIP BLANK

Client Name: H+GCL
 Client ID: TEXACO TUTU
 Lab ID: 031950-0009-SA
 Matrix: AQUEOUS

Sampled: 30 NOV 93
 Received: 03 DEC 93
 Authorized: 05 DEC 93

Prepared: NA
 Analyzed: 09 DEC 93

Parameter	Result	Units	Reporting Limit	
Chloromethane	ND	ug/L	10	
Bromomethane	ND	ug/L	10	
tert-Butyl Methyl ether	ND	ug/L	5.0	
Vinyl Chloride	ND	ug/L	10	
Chloroethane	ND	ug/L	10	
Methylene chloride	ND	ug/L	5.0	
Acetone	1.9	ug/L	10	J
Carbon disulfide	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	5.0	
1,1-Dichloroethane	ND	ug/L	5.0	
1,2-Dichloroethene (cis/trans)	ND	ug/L	5.0	
Chloroform	ND	ug/L	5.0	
1,2-Dichloroethane	ND	ug/L	5.0	
2-Butanone	ND	ug/L	10	
1,1,1-Trichloroethane	ND	ug/L	5.0	
Carbon tetrachloride	ND	ug/L	5.0	
Vinyl Acetate	ND	ug/L	10	
Bromodichloromethane	ND	ug/L	5.0	
1,2-Dichloropropane	ND	ug/L	5.0	
trans-1,3-Dichloropropene	ND	ug/L	5.0	
Trichloroethene	ND	ug/L	5.0	
Dibromochloromethane	ND	ug/L	5.0	
1,1,2-Trichloroethane	ND	ug/L	5.0	
Benzene	ND	ug/L	5.0	
cis-1,3-Dichloropropene	ND	ug/L	5.0	
Bromoform	ND	ug/L	5.0	
4-Methyl-2-Pentanone	ND	ug/L	10	
2-Hexanone	ND	ug/L	10	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	
Tetrachloroethene	ND	ug/L	5.0	
Toluene	ND	ug/L	5.0	
Chlorobenzene	ND	ug/L	5.0	

J = Result is detected below the reporting limit or is an estimated concentration.
 NA = Not Applicable
 ND = Not Detected

Reported By: Kelvin Wang
Approved By: Dennis Flynn

TCL Volatile Organics

Client Name: H+GCL
Client ID: TEXACO TUTU
Lab ID: 031950-0009-SA
Matrix: AQUEOUS

Method 8240
(cont.)
#9311301830
Sampled: 30 NOV 93
Received: 03 DEC 93
Authorized: 05 DEC 93

QA
TRIP BLANK
Prepared: NA
Analyzed: 09 DEC 93

Parameter	Result	Units	Reporting Limit
Ethylbenzene	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	Recovery		
Toluene-d8	100	%	
4-Bromofluorobenzene	94	%	
1,2-Dichloroethane-d4	103	%	

NA = Not Applicable
ND = Not Detected

Reported By: Kelvin Wang

Approved By: Dennis Flynn

TCL Volatile Organics
Method 8240

Client Name: H+GCL
 Client ID: TEXACO 9312030800
 Lab ID: 032021-0001-SA
 Matrix: AQUEOUS

TRIP BLANK

Sampled: 03 DEC 93
 Received: 07 DEC 93
 Authorized: 08 DEC 93

Prepared: NA
 Analyzed: 13 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	10
Bromomethane	ND	ug/L	10
tert-Butyl Methyl ether	ND	ug/L	5.0
Vinyl Chloride	ND	ug/L	10
Chloroethane	ND	ug/L	10
Methylene chloride	ND	ug/L	5.0
Acetone	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/L	5.0
Chloroform	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
2-Butanone	ND	ug/L	10
1,1,1-Trichloroethane	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Vinyl Acetate	ND	ug/L	10
Bromodichloromethane	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Benzene	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
4-Methyl-2-Pentanone	ND	ug/L	10
2-Hexanone	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Ethylbenzene	ND	ug/L	5.0

NA = Not Applicable
 ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan

TCL Volatile OrganicsMethod 8240
(cont.)Client Name: H+GCL
Client ID: TEXACO 9312030800
Lab ID: 032021-0001-SA
Matrix: AQUEOUS*Trip Blank*
Sampled: 03 DEC 93
Received: 07 DEC 93
Authorized: 08 DEC 93Prepared: NA
Analyzed: 13 DEC 93

Parameter	Result	Units	Reporting Limit
Styrene	ND	ug/L	5.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	Recovery		
Toluene-d8	99	%	
4-Bromofluorobenzene	99	%	
1,2-Dichloroethane-d4	110	%	

NA = Not Applicable
ND = Not Detected

Reported By: Salman Qazi

Approved By: Wayne Halozan



TCL Volatile Organics

Method 8240

Client Name: H+GCL
 Client ID: 9312070745
 Lab ID: 032087-0001-SA
 Matrix: AQUEOUS

TRIP BLANK

Sampled: 07 DEC 93
 Received: 09 DEC 93
 Authorized: 12 DEC 93

Prepared: NA
 Analyzed: 16 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	10
Bromomethane	ND	ug/L	10
tert-Butyl Methyl ether	ND	ug/L	5.0
Vinyl Chloride	ND	ug/L	10
Chloroethane	ND	ug/L	10
Methylene chloride	ND	ug/L	5.0
Acetone	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethene (cis/ trans)	ND	ug/L	5.0
Chloroform	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
2-Butanone	ND	ug/L	10
1,1,1-Trichloroethane	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Vinyl Acetate	ND	ug/L	10
Bromodichloromethane	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Benzene	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
4-Methyl-2-Pentanone	ND	ug/L	10
2-Hexanone	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Ethylbenzene	ND	ug/L	5.0

NA = Not Applicable
 ND = Not Detected

Reported By: Clifford Merceron

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

(cont.)

Client Name: H+GCL
Client ID: 9312070745
Lab ID: 032087-0001-SA
Matrix: AQUEOUS

TRAP BLANK
Sampled: 07 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93

Prepared: NA
Analyzed: 16 DEC 93

Parameter	Result	Units	Reporting Limit	
Styrene	ND	ug/L	5.0	
Xylenes (total)	1.5	ug/L	5.0	J
Surrogate	Recovery			
Toluene-d8	98	%		
4-Bromofluorobenzene	101	%		
1,2-Dichloroethane-d4	104	%		

J = Result is detected below the reporting limit or is an estimated concentration.
NA = Not Applicable
ND = Not Detected

Reported By: Clifford Merceron

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

Client Name: H+GCL
Client ID: 9312071110
Lab ID: 032087-0006-SA
Matrix: AQUEOUS

FIELD BLANK

Sampled: 07 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93

Prepared: NA
Analyzed: 16 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	10
Bromomethane	ND	ug/L	10
tert-Butyl Methyl ether	ND	ug/L	5.0
Vinyl Chloride	ND	ug/L	10
Chloroethane	ND	ug/L	10
Methylene chloride	ND	ug/L	5.0
Acetone	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethene (cis/ trans)	ND	ug/L	5.0
Chloroform	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
2-Butanone	ND	ug/L	10
1,1,1-Trichloroethane	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Vinyl Acetate	ND	ug/L	10
Bromodichloromethane	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Benzene	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
4-Methyl-2-Pentanone	ND	ug/L	10
2-Hexanone	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Ethylbenzene	ND	ug/L	5.0

NA = Not Applicable
ND = Not Detected

Reported By: Clifford Merceron

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

(cont.)

Client Name: H+GCL

Client ID: 9312071110

Lab ID: 032087-0006-SA

Matrix: AQUEOUS

FIELD Blank

Sampled: 07 DEC 93

Received: 09 DEC 93

Authorized: 12 DEC 93

Prepared: NA

Analyzed: 16 DEC 93

Parameter	Result	Units	Reporting Limit
Styrene	ND	ug/L	5.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	Recovery		
Toluene-d8	100	%	
4-Bromofluorobenzene	102	%	
1,2-Dichloroethane-d4	102	%	

NA = Not Applicable

ND = Not Detected

Reported By: Clifford Merceron

Approved By: David Ercoliani

METHOD BLANK SAMPLE REPORT
TCL Volatile Organics

 Method 8240
 Project: 032021

 Category: 8240-AQ Method 8240 - Volatile Organics by GC/MS
 Matrix: AQUEOUS
 QC Lot: 13 DEC 93-G QC Run: 13 DEC 93-A

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	10
Bromomethane	ND	ug/L	10
tert-Butyl Methyl ether	ND	ug/L	5.0
Vinyl Chloride	ND	ug/L	10
Chloroethane	ND	ug/L	10
Methylene chloride	ND	ug/L	5.0
Acetone	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/L	5.0
Chloroform	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
2-Butanone	ND	ug/L	10
1,1,1-Trichloroethane	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Vinyl Acetate	ND	ug/L	10
Bromodichloromethane	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Benzene	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
4-Methyl-2-Pentanone	ND	ug/L	10
2-Hexanone	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Ethylbenzene	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
Xylenes (total)	ND	ug/L	5.0



TCL Volatile Organics

Method 8240

3 1/2 Bziker Rinse

Client Name: H+GCL
Client ID: 9312071115
Lab ID: 032087-0007-SA
Matrix: AQUEOUS

Sampled: 07 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93

Prepared: NA
Analyzed: 16 DEC 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	10
Bromomethane	ND	ug/L	10
tert-Butyl Methyl ether	ND	ug/L	5.0
Vinyl Chloride	ND	ug/L	10
Chloroethane	ND	ug/L	10
Methylene chloride	ND	ug/L	5.0
Acetone	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethene (cis/ trans)	ND	ug/L	5.0
Chloroform	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
2-Butanone	ND	ug/L	10
1,1,1-Trichloroethane	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Vinyl Acetate	ND	ug/L	10
Bromodichloromethane	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Benzene	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
4-Methyl-2-Pentanone	ND	ug/L	10
2-Hexanone	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Ethylbenzene	ND	ug/L	5.0

NA = Not Applicable
ND = Not Detected

Reported By: Clifford Merceron

Approved By: David Ercoliani



TCL Volatile Organics

Method 8240

(cont.)

3 1/2 " Bziler Rms etc

Client Name: H+GCL
Client ID: 9312071115
Lab ID: 032087-0007-SA
Matrix: AQUEOUS

Sampled: 07 DEC 93
Received: 09 DEC 93
Authorized: 12 DEC 93
Prepared: NA
Analyzed: 16 DEC 93

Parameter	Result	Units	Reporting Limit
Styrene	ND	ug/L	5.0
Xylenes (total)	ND	ug/L	5.0
Surrogate	Recovery		
Toluene-d8	97	%	
4-Bromofluorobenzene	101	%	
1,2-Dichloroethane-d4	104	%	

NA = Not Applicable
ND = Not Detected

Reported By: Clifford Merceron

Approved By: David Ercoliani

ENSECO QA/QC DOCUMENTATION

QUALITY ASSURANCE/QUALITY CONTROL

To ensure data quality, an extensive QA/QC program has been implemented at Enseco - East which incorporates the following controls (as applicable).

Reagent or analytical blanks are analyzed to assess the level of contamination which exists in the analytical system. An analytical blank, analyzed with every batch of samples, consists of reagents specific to the method. This blank is carried through every aspect of the procedure, including preparation, cleanup, and analysis. Ideally, the concentration of an analyte in the blank is below the reporting limit for that analyte. However, some common laboratory solvents and metals are difficult to eliminate to the part-per-billion levels commonly reported in environmental analyses.

Duplicate control samples (DCS) are used to monitor the laboratory's day-to-day performance of routine analytical methods. A DCS consists of a standard, control matrix which is spiked with a group of target compounds representative of the method analytes. The DCS is analyzed with environmental samples to provide evidence that the laboratory is performing the method within accepted QC guidelines.

A DCS has been established for most routine analytical methods. Reagent water is used as the control matrix for the analysis of aqueous samples. The DCS compounds are spiked into reagent water and carried through the appropriate steps of the analysis. As stated in SW-846 (third edition), a universal blank matrix does not exist for solid samples and therefore no matrix is used. The DCS for solid samples consists of the appropriate steps of the analysis. The data thus obtained are used to set the DCS control limits. The control limits for accuracy are based on the historical average recovery of the DCS plus or minus three standard deviation units. The control limits for precision are based on the historical relative percent difference (RPD) and range from zero (no difference between duplicate samples) to the average RPD plus three standard deviation units.

Surrogates are organic compounds that are similar to the analytes of interest in chemical behavior but which are not normally found in environmental samples. Surrogates are routinely added to samples requiring GC/MS analysis to monitor the effect of the matrix on the accuracy of the analysis. Results are reported in terms of percent recovery.

ANALYTICAL RESULTS

The method number provided on each data report sheet refers to a publication originating from a regulatory or standard-setting organization. In general, the methods employed are those specified by the U.S. Environmental Protection Agency and other state and federal agencies. In cases where an approved regulatory method does not exist, a method developed by Enseco will be employed to meet the specific needs of the client. The methods commonly employed by Enseco are based on methods from the following references.

U.S. Environmental Protection Agency. Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020. Cincinnati, OH, March, 1993.

U.S. Environmental Protection Agency. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846). Washington, D.C., November, 1986.

U.S. Environmental Protection Agency. Methods for Determination of Organic Compounds in Finished Drinking Water and Raw Source Water. Cincinnati, OH, September, 1986.

"Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act," 40 CFR, Part 136; Federal Register, 1984.

American Public Health Association, American Water Works Association, Water Pollution Control Federation. Standard Methods for the Examination of Water and Wastewater, 16th Edition. Washington, D.C., April, 1985.

EPA Contract Laboratory Program (CLP) protocols for the analysis of organic and inorganic hazardous substances.

Case Narrative for Enseco-East Project No. 031950

GC/MS Volatile Analysis:

The reporting limits of Enseco-East sample number 031950-0008 were raised due to the presence of high levels of matrix interferences. This sample was analyzed at a 1:5 dilution.


Dennis W. Flynn
Organic Laboratory Director

12-17-93
Date

SAMPLE DESCRIPTION INFORMATION
for
H+GCL

Lab ID	Client ID	Matrix	Sampled		Received
			Date	Time	
031950-0001-SA	SB-2 (3')	SOIL	30 NOV 93	10:54	03 DEC 93
031950-0002-SA	SB-2 (5')	SOIL	30 NOV 93	11:44	03 DEC 93
031950-0003-SA	TEXACO TUTU	AQUEOUS	30 NOV 93	12:35	03 DEC 93
031950-0004-SA	TEXACO TUTU	AQUEOUS	30 NOV 93	12:40	03 DEC 93
031950-0005-SA	SB-3 (3')	SOIL	30 NOV 93	13:55	03 DEC 93
031950-0006-SA	SB-3 (5')	SOIL	30 NOV 93	15:05	03 DEC 93
031950-0007-SA	SB-1 (3')	SOIL	30 NOV 93	16:30	03 DEC 93
031950-0008-SA	SB-1 (5')	SOIL	30 NOV 93	17:10	03 DEC 93
031950-0009-SA	TEXACO TUTU	AQUEOUS	30 NOV 93	18:30	03 DEC 93
031950-0010-SA	TT-4	SOIL	02 DEC 93	09:05	03 DEC 93
031950-0011-SA	TT-4	SOIL	02 DEC 93	09:10	03 DEC 93
031950-0012-SA	SB-4	SOIL	02 DEC 93	10:45	03 DEC 93
031950-0013-SA	SB-4	SOIL	02 DEC 93	10:50	03 DEC 93
031950-0014-SA	IG/SB-2	SOIL	02 DEC 93	12:35	03 DEC 93
031950-0015-SA	TEXACO	AQUEOUS	01 DEC 93	12:40	03 DEC 93
031950-0016-SA	ST/SB-1	SOIL	01 DEC 93	14:00	03 DEC 93
031950-0017-SA	IG/SB-1	SOIL	01 DEC 93	18:00	03 DEC 93

SAMPLE DESCRIPTION INFORMATION
for
H+GCL

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
032021-0001-SA	TEXACO 9312030800	AQUEOUS	03 DEC 93	08:00	07 DEC 93
032021-0002-SA	TT-5 9312031215	SOIL	03 DEC 93	12:15	07 DEC 93
032021-0003-SA	TT-5 9312031220	SOIL	03 DEC 93	12:20	07 DEC 93
032021-0004-SA	OW/SB-1 9312041000	SOIL	04 DEC 93	10:00	07 DEC 93
032021-0005-SA	TT-2 9312041100	SOIL	04 DEC 93	11:00	07 DEC 93
032021-0006-SA	TT-2 9312041130	SOIL	04 DEC 93	11:30	07 DEC 93
032021-0007-SA	SB-5 9312041320	SOIL	04 DEC 93	13:20	07 DEC 93
032021-0008-SA	SB-6 9312041550	SOIL	04 DEC 93	15:50	07 DEC 93
032021-0009-SA	SB-6 9312041555	SOIL	04 DEC 93	15:55	07 DEC 93

SAMPLE DESCRIPTION INFORMATION
for
Enseco East

Lab ID	Client ID	Matrix	Sampled Date Time	Received Date
032984-0001-SA	9312091245	AQUEOUS	09 DEC 93	18 DEC 93
032984-0002-SA	9312100740	AQUEOUS	10 DEC 93	18 DEC 93
032984-0003-SA	9312100905	AQUEOUS	10 DEC 93	18 DEC 93
032984-0004-SA	9312101010	AQUEOUS	10 DEC 93	18 DEC 93
032984-0005-SA	9312101115	AQUEOUS	10 DEC 93	18 DEC 93
032984-0006-SA	9312101230	AQUEOUS	10 DEC 93	18 DEC 93
032984-0007-SA	9312101230	AQUEOUS	10 DEC 93	18 DEC 93
032984-0008-SA	9312101445	AQUEOUS	10 DEC 93	18 DEC 93
032984-0009-SA	9312101540	AQUEOUS	10 DEC 93	18 DEC 93
032984-0010-SA	9312111130	AQUEOUS	10 DEC 93	18 DEC 93
032984-0011-SA	9312111645	AQUEOUS	10 DEC 93	18 DEC 93
032984-0012-SA	9312111650	AQUEOUS	10 DEC 93	18 DEC 93
032984-0013-SA	9312130945	WASTE	10 DEC 93	18 DEC 93
032984-0014-SA	9312130955	WASTE	10 DEC 93	18 DEC 93
032984-0015-SA	9312131010	WASTE	10 DEC 93	18 DEC 93
032984-0016-SA	9312131040	WASTE	10 DEC 93	18 DEC 93

QC LOT ASSIGNMENT REPORT
TCL Volatile Organics

Method 8240

Laboratory Sample Number	QC Matrix	QC Category	QC Lot	QC Run
031950-0003-SA	AQUEOUS	8240-AQ	09 DEC 93-D	09 DEC 93-A
031950-0004-SA	AQUEOUS	8240-AQ	09 DEC 93-D	09 DEC 93-A
031950-0009-SA	AQUEOUS	8240-AQ	09 DEC 93-D	09 DEC 93-A
031950-0015-SA	AQUEOUS	8240-AQ	09 DEC 93-D	09 DEC 93-A

QC LOT ASSIGNMENT REPORT
TCL Volatile Organics

Method 8240

Laboratory Sample Number	QC Matrix	QC Category	QC Lot	QC Run
032021-0001-SA	AQUEOUS	8240-AQ	13 DEC 93-G	13 DEC 93-A

DUPLICATE CONTROL SAMPLE REPORT
TCL Volatile Organics
Method 8240
Project: 031950
Category: 8240-AQ Method 8240 - Volatile Organics by GC/MS
Matrix: AQUEOUS
QC Lot: 09 DEC 93-D
Concentration Units: ug/L

Analyte	-----Concentration-----				Accuracy		Precision	
	Spiked	-----Measured-----			Average(%)		(RPD)	
		DCS1	DCS2	AVG	DCS	Limits	DCS	Limit
1,1-Dichloroethene	50.0	52.6	51.8	52.2	104	61-145	1.5	14
Trichloroethene	50.0	46.7	47.3	47.0	94	71-120	1.3	14
Benzene	50.0	50.6	50.6	50.6	101	76-127	0.0	11
Toluene	50.0	48.4	49.4	48.9	98	76-125	2.0	13
Chlorobenzene	50.0	48.8	48.8	48.8	98	75-130	0.0	13

Calculations are performed before rounding to avoid round-off errors in calculated results.

SINGLE CONTROL SAMPLE REPORT**TCL Volatile Organics****Method 8240****Project: 031950****Category: 8240-AQ Method 8240 - Volatile Organics by GC/MS****Matrix: AQUEOUS****QC Lot: 09 DEC 93-D QC Run: 09 DEC 93-A****Concentration Units: ug/L**

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
1,2-Dichloroethane-d4	50.0	49.2	98	76-114
4-Bromofluorobenzene	50.0	47.9	96	86-115
Toluene-d8	50.0	49.6	99	88-110

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK SAMPLE REPORT

TCL Volatile Organics

Method 8240
Project: 031950

Category: 8240-AQ Method 8240 - Volatile Organics by GC/MS
Matrix: AQUEOUS
QC Lot: 09 DEC 93-D QC Run: 09 DEC 93-A

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	10
Bromomethane	ND	ug/L	10
tert-Butyl Methyl ether	ND	ug/L	5.0
Vinyl Chloride	ND	ug/L	10
Chloroethane	ND	ug/L	10
Methylene chloride	ND	ug/L	5.0
Acetone	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/L	5.0
Chloroform	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
2-Butanone	ND	ug/L	10
1,1,1-Trichloroethane	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Vinyl Acetate	ND	ug/L	10
Bromodichloromethane	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Benzene	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
4-Methyl-2-Pentanone	ND	ug/L	10
2-Hexanone	ND	ug/L	10
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Ethylbenzene	1.2 J	ug/L	5.0
Styrene	ND	ug/L	5.0
Xylenes (total)	ND	ug/L	5.0

Enseco
A CORMAC COMPANY

Volatile Organics
Target Compound List (TCL)
Method 8240

Client Name: H+GCL
Client ID: 9312100740
Lab ID: 032984-0002-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

TRIP BLANK

Sampled: 10 DEC 93
Prepared: 22 DEC 93

Received: 18 DEC 93
Analyzed: 22 DEC 93

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	10
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Dibromochloromethane	ND	ug/L	5.0
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
1,2-Dichloroethene	ND	ug/L	5.0
(total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
Ethylbenzene	ND	ug/L	5.0
2-Hexanone	ND	ug/L	10
tert-Butyl methyl ether	ND	ug/L	5.0
Methylene chloride	7.9	ug/L	5.0
4-Methyl-2-pentanone	ND	ug/L	10
(MIBK)	ND	ug/L	5.0
Styrene	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0
Surrogate	Recovery		
Toluene-d8	102	%	

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

PUT 005 1619

Enseco
A Chemical CompanyVolatile Organics
Target Compound List (TCL)
Method 8240Client Name: H+GCL
Client ID: 9312100740
Lab ID: 032984-0002-SA
Matrix: AQUEOUS
Authorized: 18 DEC 93

Trey Brunk

Sampled: 10 DEC 93
Prepared: 22 DEC 93Received: 18 DEC 93
Analyzed: 22 DEC 93

Surrogate

Recovery

4-Bromofluorobenzene
1,2-Dichloroethane-d497 %
98 %ND = Not detected
NA = Not applicable

Reported By: Mike Hoffman

Approved By: Kristin Tollefson

QC LOT ASSIGNMENT REPORT
TCL Volatile Organics

Method 8240

Laboratory Sample Number	QC Matrix	QC Category	QC Lot	QC Run
031950-0001-SA	SOLID	8240-SL	08 DEC 93-L	08 DEC 93-A
031950-0002-SA	SOLID	8240-SL	08 DEC 93-L	09 DEC 93-A
031950-0005-SA	SOLID	8240-SL	10 DEC 93-L	10 DEC 93-A
031950-0006-SA	SOLID	8240-SL	08 DEC 93-L	09 DEC 93-A
031950-0007-SA	SOLID	8240-SL	08 DEC 93-L	09 DEC 93-A
031950-0008-SA	SOLID	8240-SL	10 DEC 93-L	10 DEC 93-A
031950-0010-SA	SOLID	8240-SL	08 DEC 93-L	09 DEC 93-A
031950-0011-SA	SOLID	8240-SL	08 DEC 93-L	09 DEC 93-A
031950-0012-SA	SOLID	8240-SL	08 DEC 93-L	09 DEC 93-A
031950-0013-SA	SOLID	8240-SL	10 DEC 93-L	09 DEC 93-A
031950-0014-SA	SOLID	8240-SL	10 DEC 93-L	09 DEC 93-A
031950-0016-SA	SOLID	8240-SL	10 DEC 93-L	09 DEC 93-A
031950-0017-SA	SOLID	8240-SL	10 DEC 93-L	10 DEC 93-A

DUPLICATE CONTROL SAMPLE REPORT

TCL Volatile Organics

Method 8240

Project: 031950

Category: 8240-SL Volatile Organics in solids--low level

Matrix: SOIL

QC Lot: 08 DEC 93-L

Concentration Units: ug/kg

Analyte	Spiked	Concentration			Accuracy		Precision	
		Measured			Average(%)		(RPD)	
		DCS1	DCS2	AVG	DCS	Limits	DCS Limit	
1,1-Dichloroethene	50.0	53.3	51.1	52.2	104	59-172	4.2	22
Trichloroethene	50.0	50.6	49.1	49.8	100	62-137	3.0	24
Benzene	50.0	50.1	48.7	49.4	99	66-142	2.8	21
Toluene	50.0	50.7	48.8	49.8	100	59-139	3.8	21
Chlorobenzene	50.0	51.2	49.5	50.4	101	60-133	3.4	21

Category: 8240-SL Volatile Organics in solids--low level

Matrix: SOIL

QC Lot: 10 DEC 93-L

Concentration Units: ug/kg

Analyte	Spiked	Concentration			Accuracy		Precision	
		Measured			Average(%)		(RPD)	
		DCS1	DCS2	AVG	DCS	Limits	DCS Limit	
1,1-Dichloroethene	50.0	49.9	49.8	49.8	100	59-172	0.20	22
Trichloroethene	50.0	48.8	49.4	49.1	98	62-137	1.2	24
Benzene	50.0	49.3	49.9	49.6	99	66-142	1.2	21
Toluene	50.0	47.3	47.8	47.6	95	59-139	1.1	21
Chlorobenzene	50.0	47.8	48.4	48.1	96	60-133	1.2	21

Calculations are performed before rounding to avoid round-off errors in calculated results.

SINGLE CONTROL SAMPLE REPORT
TCL Volatile Organics

Method 8240
 Project: 031950

Category: 8240-SL Volatile Organics in solids--low level
 Matrix: SOIL
 QC Lot: 08 DEC 93-L QC Run: 08 DEC 93-A
 Concentration Units: ug/kg

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
1,2-Dichloroethane-d4	50.0	47.6	95	70-121
4-Bromofluorobenzene	50.0	46.4	93	74-121
Toluene-d8	50.0	48.8	98	81-117

Category: 8240-SL Volatile Organics in solids--low level
 Matrix: SOIL
 QC Lot: 08 DEC 93-L QC Run: 09 DEC 93-A
 Concentration Units: ug/kg

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
1,2-Dichloroethane-d4	50.0	49.2	98	70-121
4-Bromofluorobenzene	50.0	49.0	98	74-121
Toluene-d8	50.0	49.9	100	81-117

Category: 8240-SL Volatile Organics in solids--low level
 Matrix: SOIL
 QC Lot: 10 DEC 93-L QC Run: 10 DEC 93-A
 Concentration Units: ug/kg

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
1,2-Dichloroethane-d4	50.0	50.4	101	70-121
4-Bromofluorobenzene	50.0	48.9	98	74-121
Toluene-d8	50.0	49.9	100	81-117

Category: 8240-SL Volatile Organics in solids--low level
 Matrix: SOIL
 QC Lot: 10 DEC 93-L QC Run: 09 DEC 93-A
 Concentration Units: ug/kg

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
1,2-Dichloroethane-d4	50.0	49.2	98	70-121
4-Bromofluorobenzene	50.0	49.0	98	74-121
Toluene-d8	50.0	49.9	100	81-117

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK SAMPLE REPORT
TCL Volatile Organics

Method 8240
 Project: 031950

Category: 8240-SL Volatile Organics in solids--low level
 Matrix: SOIL
 QC Lot: 08 DEC 93-L QC Run: 08 DEC 93-A

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	10
tert-Butyl Methyl ether	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
Vinyl Chloride	ND	ug/kg	10
Chloroethane	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
Acetone	ND	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethene (cis/ trans)	ND	ug/kg	5.0
Chloroform	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
2-Butanone	ND	ug/kg	10
1,1,1-Trichloroethane	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Vinyl Acetate	ND	ug/kg	10
Bromodichloromethane	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Dibromochloromethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Benzene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
4-Methyl-2-Pentanone	ND	ug/kg	10
2-Hexanone	ND	ug/kg	10
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
Styrene	ND	ug/kg	5.0
Xylenes (total)	ND	ug/kg	5.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK SAMPLE REPORT
TCL Volatile Organics

Method 8240

Project: 031950 (cont.)

Category: 8240-SL Volatile Organics in solids--low level

Matrix: SOIL

QC Lot: 08 DEC 93-L QC Run: 09 DEC 93-A

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	10
tert-Butyl Methyl ether	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
Vinyl Chloride	ND	ug/kg	10
Chloroethane	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
Acetone	ND	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.0
Chloroform	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
2-Butanone	ND	ug/kg	10
1,1,1-Trichloroethane	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Vinyl Acetate	ND	ug/kg	10
Bromodichloromethane	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Dibromochloromethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Benzene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
4-Methyl-2-Pentanone	ND	ug/kg	10
2-Hexanone	ND	ug/kg	10
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
Styrene	ND	ug/kg	5.0
Xylenes (total)	ND	ug/kg	5.0

Calculations are performed before rounding to avoid round-off errors in calculated results

METHOD BLANK SAMPLE REPORT
TCL Volatile Organics

Method 8240

Project: 031950 (cont.)

Category: 8240-SL Volatile Organics in solids—low level

Matrix: SOIL

QC Lot: 10 DEC 93-L QC Run: 10 DEC 93-A

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	10
tert-Butyl Methyl ether	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
Vinyl Chloride	ND	ug/kg	10
Chloroethane	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
Acetone	ND	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.0
Chloroform	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
2-Butanone	ND	ug/kg	10
1,1,1-Trichloroethane	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Vinyl Acetate	ND	ug/kg	10
Bromodichloromethane	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Dibromochloromethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Benzene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
4-Methyl-2-Pentanone	ND	ug/kg	10
2-Hexanone	ND	ug/kg	10
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
Styrene	ND	ug/kg	5.0
Xylenes (total)	ND	ug/kg	5.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK SAMPLE REPORT

TCL Volatile Organics

Method 8240

Project: 031950 (cont.)

Category: 8240-SL Volatile Organics in solids--low level

Matrix: SOIL

QC Lot: 10 DEC 93-L QC Run: 09 DEC 93-A

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	10
tert-Butyl Methyl ether	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
Vinyl Chloride	ND	ug/kg	10
Chloroethane	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
Acetone	ND	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.0
Chloroform	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
2-Butanone	ND	ug/kg	10
1,1,1-Trichloroethane	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Vinyl Acetate	ND	ug/kg	10
Bromodichloromethane	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Dibromochloromethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Benzene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
4-Methyl-2-Pentanone	ND	ug/kg	10
2-Hexanone	ND	ug/kg	10
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
Styrene	ND	ug/kg	5.0
Xylenes (total)	ND	ug/kg	5.0

DUPLICATE CONTROL SAMPLE REPORT

TCL Volatile Organics

Method 8240

Project: 032021

Category: 8240-AQ Method 8240 - Volatile Organics by GC/MS

Matrix: AQUEOUS

QC Lot: 13 DEC 93-G

Concentration Units: ug/L

Analyte	Spiked	Concentration			Accuracy		Precision	
		Measured			Average(%)		(RPD)	
		DCS1	DCS2	AVG	DCS	Limits	DCS	Limit
1,1-Dichloroethene	50.0	47.5	48.7	48.1	96	61-145	2.5	14
Trichloroethene	50.0	47.5	47.5	47.5	95	71-120	0.0	14
Benzene	50.0	48.9	50.5	49.7	99	76-127	3.2	11
Toluene	50.0	45.4	46.5	46.0	92	76-125	2.4	13
Chlorobenzene	50.0	49.6	48.7	49.2	98	75-130	1.8	13

Calculations are performed before rounding to avoid round-off errors in calculated results.

SINGLE CONTROL SAMPLE REPORT**TCL Volatile Organics**

Method 8240
Project: 032021

Category: 8240-AQ Method 8240 - Volatile Organics by GC/MS
Matrix: AQUEOUS
QC Lot: 13 DEC 93-G QC Run: 13 DEC 93-A
Concentration Units: ug/L

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
1,2-Dichloroethane-d4	50.0	50.5	101	76-114
4-Bromofluorobenzene	50.0	48.6	97	86-115
Toluene-d8	50.0	48.7	97	88-110

Calculations are performed before rounding to avoid round-off errors in calculated results.

QC LOT ASSIGNMENT REPORT
TCL Volatile Organics

Method 8240

Laboratory Sample Number	QC Matrix	QC Category	QC Lot	QC Run
032021-0002-SA	SOLID	8240-SL	13 DEC 93-L	13 DEC 93-A
032021-0003-SA	SOLID	8240-SL	13 DEC 93-L	13 DEC 93-A
032021-0004-SA	SOLID	8240-SL	13 DEC 93-L	13 DEC 93-A
032021-0005-SA	SOLID	8240-SL	13 DEC 93-L	13 DEC 93-A
032021-0006-SA	SOLID	8240-SL	13 DEC 93-L	13 DEC 93-A
032021-0007-SA	SOLID	8240-SL	13 DEC 93-L	13 DEC 93-A
032021-0008-SA	SOLID	8240-SL	13 DEC 93-L	13 DEC 93-A
032021-0009-SA	SOLID	8240-SL	14 DEC 93-L	14 DEC 93-A

DUPLICATE CONTROL SAMPLE REPORT

TCL Volatile Organics

Method 8240
Project: 032021

Category: 8240-SL Volatile Organics in solids--low level
Matrix: SOLID
QC Lot: 13 DEC 93-L
Concentration Units: ug/kg

Analyte	Spiked	-----Concentration-----			Accuracy		Precision	
		-----Measured-----			Average(%)		(RPD)	
		DCS1	DCS2	AVG	DCS	Limits	DCS	Limit
1,1-Dichloroethene	50.0	53.0	52.2	52.6	105	59-172	1.5	22
Trichloroethene	50.0	49.9	49.1	49.5	99	62-137	1.6	24
Benzene	50.0	49.6	49.0	49.3	99	66-142	1.2	21
Toluene	50.0	47.7	48.2	48.0	96	59-139	1.0	21
Chlorobenzene	50.0	47.6	47.5	47.6	95	60-133	0.21	21

Category: 8240-SL Volatile Organics in solids--low level
Matrix: SOLID
QC Lot: 14 DEC 93-L
Concentration Units: ug/kg

Analyte	Spiked	-----Concentration-----			Accuracy		Precision	
		-----Measured-----			Average(%)		(RPD)	
		DCS1	DCS2	AVG	DCS	Limits	DCS	Limit
1,1-Dichloroethene	50.0	48.3	47.8	48.0	96	59-172	1.0	22
Trichloroethene	50.0	44.1	44.0	44.0	88	62-137	0.23	24
Benzene	50.0	45.2	45.2	45.2	90	66-142	0.0	21
Toluene	50.0	44.4	43.3	43.8	88	59-139	2.5	21
Chlorobenzene	50.0	42.9	42.1	42.5	85	60-133	1.9	21

Calculations are performed before rounding to avoid round-off errors in calculated results.

SINGLE CONTROL SAMPLE REPORT

TCL Volatile Organics

Method 8240

Project: 032021

Category: 8240-SL Volatile Organics in solids--low level

Matrix: SOLID

QC Lot: 13 DEC 93-L QC Run: 13 DEC 93-A

Concentration Units: ug/kg

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
1,2-Dichloroethane-d4	50.0	50.6	101	70-121
4-Bromofluorobenzene	50.0	50.0	100	74-121
Toluene-d8	50.0	50.9	102	81-117

Category: 8240-SL Volatile Organics in solids--low level

Matrix: SOLID

QC Lot: 14 DEC 93-L QC Run: 14 DEC 93-A

Concentration Units: ug/kg

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
1,2-Dichloroethane-d4	50.0	49.0	98	70-121
4-Bromofluorobenzene	50.0	48.9	98	74-121
Toluene-d8	50.0	49.2	98	81-117

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK SAMPLE REPORT
TCL Volatile Organics

 Method 8240
 Project: 032021

Category: 8240-SL Volatile Organics in solids--low level

Matrix: SOIL

QC Lot: 13 DEC 93-L QC Run: 13 DEC 93-A

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	10
tert-Butyl Methyl ether	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
Vinyl Chloride	ND	ug/kg	10
Chloroethane	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
Acetone	2.4 J	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.0
Chloroform	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
2-Butanone	ND	ug/kg	10
1,1,1-Trichloroethane	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Vinyl Acetate	ND	ug/kg	10
Bromodichloromethane	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Dibromochloromethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Benzene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
4-Methyl-2-Pentanone	ND	ug/kg	10
2-Hexanone	ND	ug/kg	10
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
Styrene	ND	ug/kg	5.0
Xylenes (total)	ND	ug/kg	5.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK SAMPLE REPORT
TCL Volatile Organics

Method 8240

Project: 032021 (cont.)

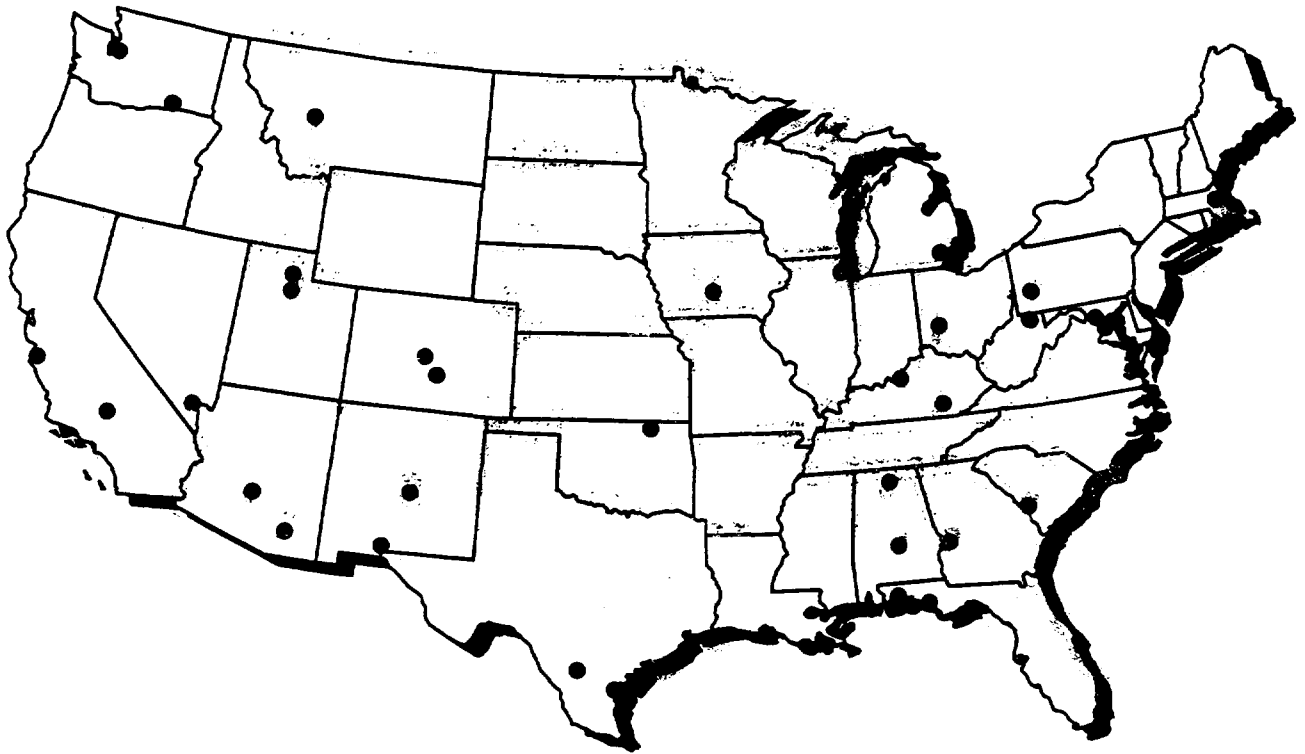
Category: 8240-SL Volatile Organics in solids--low level

Matrix: SOIL

QC Lot: 14 DEC 93-L QC Run: 14 DEC 93-A

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/kg	10
tert-Butyl Methyl ether	ND	ug/kg	5.0
Bromomethane	ND	ug/kg	10
Vinyl Chloride	ND	ug/kg	10
Chloroethane	ND	ug/kg	10
Methylene chloride	ND	ug/kg	5.0
Acetone	ND	ug/kg	10
Carbon disulfide	ND	ug/kg	5.0
1,1-Dichloroethene	ND	ug/kg	5.0
1,1-Dichloroethane	ND	ug/kg	5.0
1,2-Dichloroethene (cis/trans)	ND	ug/kg	5.0
Chloroform	ND	ug/kg	5.0
1,2-Dichloroethane	ND	ug/kg	5.0
2-Butanone	ND	ug/kg	10
1,1,1-Trichloroethane	ND	ug/kg	5.0
Carbon tetrachloride	ND	ug/kg	5.0
Vinyl Acetate	ND	ug/kg	10
Bromodichloromethane	ND	ug/kg	5.0
1,2-Dichloropropane	ND	ug/kg	5.0
cis-1,3-Dichloropropene	ND	ug/kg	5.0
Trichloroethene	ND	ug/kg	5.0
Dibromochloromethane	ND	ug/kg	5.0
1,1,2-Trichloroethane	ND	ug/kg	5.0
Benzene	ND	ug/kg	5.0
trans-1,3-Dichloropropene	ND	ug/kg	5.0
Bromoform	ND	ug/kg	5.0
4-Methyl-2-Pentanone	ND	ug/kg	10
2-Hexanone	ND	ug/kg	10
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.0
Tetrachloroethene	ND	ug/kg	5.0
Toluene	ND	ug/kg	5.0
Chlorobenzene	ND	ug/kg	5.0
Ethylbenzene	ND	ug/kg	5.0
Styrene	ND	ug/kg	5.0
Xylenes (total)	ND	ug/kg	5.0

Office Locations



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Montgomery, Alabama
Huntsville, Alabama
Phoenix, Arizona
Tucson, Arizona
Redlands, California
Monterey, California
Denver, Colorado
Colorado Springs, Colorado
Washington, D.C.
Panama City, Florida
Pensacola, Florida
Fort Benning, Georgia
Chicago, Illinois

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Fort Knox, Kentucky
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Gaithersburg, Maryland
Germantown, Maryland
Lanham, Maryland
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